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ACCOUNT

OF THE

LIFE AND WRITINGS

OF

ADAM SMITH, LL. D.

From the *TRANSACTIONS* of the *ROYAL SOCIETY* of *EDINBURGH.*

[Read by Mr. STEWART, January 21, and March 18, 1793.]

Lately publiſhed, written by Dr. ADAM SMITH,

1. An INQUIRY into the Nature and Cauſes of the WEALTH of NATIONS. Sixth Edition, 3 Vols. 8vo. Price 1*l.* 1*s.*
2. The THEORY of MORAL SENTIMENTS; or, an Eſſay towards an Analyſis of the Principles by which Men naturally judge concerning the Conduct and Character, firſt of their Neighbours, and afterwards of themſelves. To which is added, a Diſſertation on the Origin of Languages. Sixth Edition, with very conſiderable Additions, 2 Vols. 8vo. 14*s.*

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ESSAYS

ON

PHILOSOPHICAL SUBJECTS.

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BY

The late ADAM-SMITH, LL. D.

FELLOW OF THE ROYAL SOCIETIES OF LONDON AND EDINBURGH,
&c. &c.

TO WHICH IS PREFIXED,

An ACCOUNT of the LIFE and WRITINGS of the AUTHOR;

By *DUGALD STEWART*, F. R. S. E.

LONDON:

Printed for T. CADELL Jun. and W. DAVIES (Succeſſors to Mr. CADELL)
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By the EDITORS.

THE much lamented Author of theſe Eſſays left them in the hands of his friends to be diſpoſed of as they thought proper, having immediately before his death deſtroyed many other manuſcripts which he thought unfit for being made public. When theſe were inſpected, the greater number of them appeared to be parts of a plan he once had formed, for giving a connected hiſtory of the liberal ſciences and elegant arts. It is long ſince he found it neceſſary to abandon that plan as far too extenſive; and theſe parts of it lay beſide him neglected until his death. His friends are perſuaded however, that the reader will find in them that happy connection, that full and accurate expreſſion, and that clear

illuſtration which are conſpicuous in the reſt of his works; and that though it is difficult to add much to the great fame he ſo juſtly acquired by his other writings, theſe will be read with ſatisfaction and pleaſure.

JOSEPH BLACK.
JAMES HUTTON.

CONTENTS.

ACCOUNT of the Life and Writings of Adam Smith, LL. D. Page ix

SECT. I. From Mr. Smith's Birth till the Publication of the Theory of Moral Sentiments - - - - ibid.

II. Of the Theory of Moral Sentiments, and the Diſſertation on the Origin of Languages - - - - - xxi

III. From the Publication of the Theory of Moral Sentiments, till that of the Wealth of Nations - - - - 1

IV. Of the Inquiry into the Nature and Cauſes of the Wealth of Nations - - - - - - lxiii

V. Concluſion of the Narrative. - - - - lxxxiv

The Principles which lead and direct Philoſophical Enquiries; illuſtrated by the HISTORY *of* ASTRONOMY - - - - 1

SECT. I. Of the Effect of Unexpectedneſs or of Surpriſe - - 5

II. Of Wonder, or of the Effects of Novelty - - - 10

III. Of the Origin of Philoſophy - - - - 23

IV. The Hiſtory of Aſtronomy - - - - 29

The Principles which lead and direct Philoſophical Enquiries; illuſtrated by the HISTORY *of the* ANCIENT PHYSICS. 95

The

The Principles which lead and direct Philoſophical Enquiries; illuſtrated by the HISTORY *of the* ANCIENT LOGICS *and* METAPHYSICS Page 113

Of the Nature of that Imitation which takes place in what are called the IMITATIVE ARTS 131

Of the Affinity between MUSIC, DANCING, *and* POETRY 179

Of the Affinity between certain ENGLISH *and* ITALIAN VERSES 185

Of the EXTERNAL SENSES 195

Of the Senſe of Touching 197
Of the Senſe of Taſting 206
Of the Senſe of Smelling 207
Of the Senſe of Hearing 208
Of the Senſe of Seeing 215

ACCOUNT

OF THE

LIFE AND WRITINGS

OF

ADAM SMITH, LL.D.

SECTION I.

From Mr. SMITH's Birth till the Publication of the Theory of Moral Sentiments.

ADAM SMITH, Author of the Inquiry into the Nature and Cauſes of the Wealth of Nations, was the ſon of ADAM SMITH, Comptroller of the Cuſtoms at Kirkaldy*, and of MARGARET DOUGLAS, daughter of Mr. DOUGLAS of Strathenry. He was the only child of the marriage, and was born at Kirkaldy on the 5th of June 1723, a few months after the death of his father.

* Mr. SMITH, the father, was a native of Aberdeenſhire, and in the earlier part of his life practiſed at Edinburgh as a writer to the Signet. He was afterwards private ſecretary to the Earl of Loudoun, (during the time that he held the offices of principal Secretary of State for Scotland, and of Keeper of the Great Seal,) and continued in this ſituation till 1713 or 1714, when he was appointed comptroller of the cuſtoms at Kirkaldy. He was alſo clerk to the courts martial and councils of war for Scotland; an office which he held from 1707 till his death. As it is now ſeventy years ſince he died, the accounts I have received of him are very imperfect; but from the particulars already mentioned, it may be preſumed, that he was a man of more than common abilities.

His conſtitution during infancy was infirm and ſickly, and required all the tender ſolicitude of his ſurviving parent. She was blamed for treating him with an unlimited indulgence; but it produced no unfavourable effects on his temper or his diſpoſitions: —and he enjoyed the rare ſatisfaction of being able to repay her affection, by every attention that filial gratitude could dictate, during the long period of ſixty years.

An accident which happened to him when he was about three years old, is of too intereſting a nature to be omitted in the account of ſo valuable a life. He had been carried by his mother to Strathenry on a viſit to his uncle Mr. DOUGLAS, and was one day amuſing himſelf alone at the door of the houſe, when he was ſtolen by a party of that ſet of vagrants who are known in Scotland by the name of tinkers. Luckily he was ſoon miſſed by his uncle, who hearing that ſome vagrants had paſſed, purſued them, with what aſſiſtance he could find, till he overtook them in Leſlie wood; and was the happy inſtrument of preſerving to the world a genius, which was deſtined, not only to extend the boundaries of ſcience, but to enlighten and reform the commercial policy of Europe.

The ſchool of Kirkaldy, where Mr. SMITH received the firſt rudiments of his education, was then taught by Mr. DAVID MILLER, a teacher, in his day, of conſiderable reputation, and whoſe name deſerves to be recorded, on account of the eminent men whom that very obſcure ſeminary produced while under his direction. Of this number were Mr. OSWALD of Dunikeir; his brother, Dr. JOHN OSWALD, afterwards Biſhop of Raphoe; and our late excellent colleague, the Reverend Dr. JOHN DRYSDALE: all of them nearly contemporary with Mr. SMITH, and united with him through life by the cloſeſt ties of friendſhip.—One of his ſchool-fellows is ſtill alive;

alive*; and to his kindneſs I am principally indebted for the ſcanty materials which form the firſt part of this narrative.

Among theſe companions of his earlieſt years, Mr. SMITH ſoon attracted notice, by his paſſion for books, and by the extraordinary powers of his memory. The weakneſs of his bodily conſtitution prevented him from partaking in their more active amuſements; but he was much beloved by them on account of his temper, which, though warm, was to an uncommon degree friendly and generous. Even then he was remarkable for thoſe habits which remained with him through life, of ſpeaking to himſelf when alone, and of *abſence* in company.

From the grammar-ſchool of Kirkaldy, he was ſent, in 1737, to the Univerſity of Glaſgow, where he remained till 1740, when he went to Balliol College, Oxford, as an exhibitioner on SNELL's foundation.

Dr. MACLAINE of the Hague, who was a fellow-ſtudent of Mr. SMITH's at Glaſgow, told me ſome years ago, that his favourite purſuits while at that Univerſity were Mathematics and Natural Philoſophy; and I remember to have heard my father remind him of a geometrical problem of conſiderable difficulty, about which he was occupied at the time when their acquaintance commenced, and which had been propoſed to him as an exerciſe, by the celebrated Dr. SIMPSON.

Theſe, however, were certainly not the ſciences in which he was formed to excel; nor did they long divert him from

* GEORGE DRYSDALE, Eſq. of Kirkaldy, brother of the late Dr. DRYSDALE.

purſuits more congenial to his mind. What Lord BACON ſays of PLATO may be juſtly applied to him: "Illum, licet ad rem-"publicam non acceſſiſſet, tamen naturâ et inclinatione omnino "ad res civiles propenſum, vires eo præcipue intendiſſe; neque "de Philoſophia Naturali admodum ſollicitum eſſe; niſi quatenus "ad Philoſophi nomen et celebritatem tuendam, et ad majeſ-"tatem quandam moralibus et civilibus doctrinis addendam et "aſpergendam ſufficeret *." The ſtudy of human nature in all its branches, more particularly of the political hiſtory of mankind, opened a boundleſs field to his curioſity and ambition; and while it afforded ſcope to all the various powers of his verſatile and comprehenſive genius, gratified his ruling paſſion, of contributing to the happineſs and the improvement of ſociety. To this ſtudy, diverſified at his leiſure hours by the leſs ſevere occupations of polite literature, he ſeems to have devoted himſelf almoſt entirely from the time of his removal to Oxford; but he ſtill retained, and retained even in advanced years, a recollection of his early acquiſitions, which not only added to the ſplendour of his converſation, but enabled him to exemplify ſome of his favourite theories concerning the natural progreſs of the mind in the inveſtigation of truth, by the hiſtory of thoſe ſciences in which the connection and ſucceſſion of diſcoveries may be traced with the greateſt advantage. If I am not miſtaken too, the influence of his early taſte for the Greek geometry may be remarked in the elementary clearneſs and fulneſs, bordering ſometimes upon prolixity, with which he frequently ſtates his political reaſonings.—The lectures of the profound and eloquent Dr. HUTCHESON, which he had attended previous to his departure from Glaſgow, and of which he always ſpoke in terms of the warmeſt admiration, had, it may be reaſon-

* Redargutio Philoſophiarum.

ably

ably preſumed, a conſiderable effect in directing his talents to their proper objects.

I have not been able to collect any information with reſpect to that part of his youth which was ſpent in England. I have heard him ſay, that he employed himſelf frequently in the practice of tranſlation, (particularly from the French,) with a view to the improvement of his own ſtyle: and he uſed often to expreſs a favourable opinion of the utility of ſuch exerciſes, to all who cultivate the art of compoſition. It is much to be regretted, that none of his juvenile attempts in this way have been preſerved; as the few ſpecimens which his writings contain of his ſkill as a tranſlator, are ſufficient to ſhew the eminence he had attained in a walk of literature, which, in our country, has been ſo little frequented by men of genius.

It was probably alſo at this period of his life, that he cultivated with the greateſt care the ſtudy of languages. The knowledge he poſſeſſed of theſe, both ancient and modern, was uncommonly extenſive and accurate; and, in him, was ſubſervient, not to a vain parade of taſteleſs erudition, but to a familiar acquaintance with every thing that could illuſtrate the inſtitutions, the manners, and the ideas of different ages and nations. How intimately he had once been converſant with the more ornamental branches of learning; in particular, with the works of the Roman, Greek, French, and Italian poets, appeared ſufficiently from the hold which they kept of his memory, after all the different occupations and enquiries in which his maturer faculties had been employed *. In the Engliſh language,

* The uncommon degree in which Mr. SMITH retained poſſeſſion, even to the cloſe of his life, of different branches of knowledge which he had long ceaſed to cultivate, has been often remarked to me by my learned colleague and friend, Mr. DALZEL, Profeſſor

guage, the variety of poetical paſſages which he was not only accuſtomed to refer to occaſionally, but which he was able to repeat with correctneſs, appeared ſurpriſing even to thoſe, whoſe attention had never been directed to more important acquiſitions.

After a reſidence at Oxford of ſeven years, he returned to Kirkaldy, and lived two years with his mother; engaged in ſtudy, but without any fixed plan for his future life. He had been originally deſtined for the Church of England, and with that view had been ſent to Oxford; but not finding the eccleſiaſtical profeſſion ſuitable to his taſte, he choſe to conſult, in this inſtance, his own inclination, in preference to the wiſhes of his friends; and abandoning at once all the ſchemes which their prudence had formed for him, he reſolved to return to his own country, and to limit his ambition to the uncertain proſpect of obtaining, in time, ſome one of thoſe moderate preferments, to which literary attainments lead in Scotland.

In the year 1748, he fixed his reſidence at Edinburgh, and during that and the following years, read lectures on rhetoric and belles lettres, under the patronage of Lord KAMES. About this time, too, he contracted a very intimate friendſhip, which continued without interruption till his death, with Mr. ALEXANDER WEDDERBURN, now Lord LOUGHBOROUGH, and with Mr. WILLIAM JOHNSTONE, now Mr. PULTENEY.

'At what particular period his acquaintance with Mr. DAVID HUME commenced, does not appear from any information that

Profeſſor of Greek in this Univerſity.——Mr. DALZEL mentioned particularly the readineſs and correctneſs of Mr. SMITH's memory on philological ſubjects, and the acuteneſs and ſkill he diſplayed in various converſations with him on ſome of the *minutiæ* of Greek grammar.

I have received; but from ſome papers, now in the poſſeſſion of Mr. HUME's nephew, and which he has been ſo obliging as to allow me to peruſe, their acquaintance ſeems to have grown into friendſhip before the year 1752. It was a friendſhip on both ſides founded on the admiration of genius, and the love of ſimplicity; and which forms an intereſting circumſtance in the hiſtory of each of theſe eminent men, from the ambition which both have ſhewn to record it to poſterity.

In 1751, he was elected Profeſſor of Logic in the Univerſity of Glaſgow; and, the year following, he was removed to the Profeſſorſhip of Moral Philoſophy in the ſame Univerſity, upon the death of Mr. THOMAS CRAIGIE, the immediate ſucceſſor of Dr. HUTCHESON. In this ſituation, he remained thirteen years; a period he uſed frequently to look back to, as the moſt uſeful and happy of his life. It was indeed a ſituation in which he was eminently fitted to excel, and in which the daily labours of his profeſſion were conſtantly recalling his attention to his favourite purſuits, and familiariſing his mind to thoſe important ſpeculations he was afterwards to communicate to the world. In this view, though it afforded, in the mean time, but a very narrow ſcene for his ambition, it was probably inſtrumental, in no inconſiderable degree, to the future eminence of his literary character.

Of Mr. SMITH's lectures while a Profeſſor at Glaſgow, no part has been preſerved, excepting what he himſelf publiſhed in the Theory of Moral Sentiments and in the Wealth of Nations. The Society therefore, I am perſuaded, will liſten with pleaſure to the following ſhort account of them, for which I am indebted to a gentleman who was formerly one of Mr. SMITH's pupils, and who

continued

continued till his death to be one of his moſt intimate and valued friends.

" In the Profeſſorſhip of Logic, to which Mr. SMITH was appointed on his firſt introduction into this Univerſity, he ſoon ſaw the neceſſity of departing widely from the plan that had been followed by his predeceſſors, and of directing the attention of his pupils to ſtudies of a more intereſting and uſeful nature than the logic and metaphyſics of the ſchools. Accordingly, after exhibiting a general view of the powers of the mind, and explaining ſo much of the ancient logic as was requiſite to gratify curioſity with reſpect to an artificial method of reaſoning, which had once occupied the univerſal attention of the learned, he dedicated all the reſt of his time to the delivery of a ſyſtem of rhetoric and belles lettres. The beſt method of explaining and illuſtrating the various powers of the human mind, the moſt uſeful part of metaphyſics, ariſes from an examination of the ſeveral ways of communicating our thoughts by ſpeech, and from an attention to the principles of thoſe literary compoſitions which contribute to perſuaſion or entertainment. By theſe arts, every thing that we perceive or feel, every operation of our minds, is expreſſed and delineated in ſuch a manner, that it may be clearly diſtinguiſhed and remembered. There is, at the ſame time, no branch of literature more ſuited to youth at their firſt entrance upon philoſophy than this, which lays hold of their taſte and their feelings.

" It is much to be regretted, that the manuſcript containing Mr. SMITH's lectures on this ſubject was deſtroyed before his death. The firſt part, in point of compoſition, was highly finiſhed; and the whole diſcovered ſtrong marks of taſte and original genius.

From

From the permiſſion given to ſtudents of taking notes, many obſervations and opinions contained in theſe lectures have either been detailed in ſeparate diſſertations, or ingroſſed in general collections, which have ſince been given to the public. But theſe, as might be expected, have loſt the air of originality and the diſtinctive character which they received from their firſt author, and are often obſcured by that multiplicity of common-place matter in which they are ſunk and involved.

" About a year after his appointment to the Profeſſorſhip of Logic, Mr. SMITH was elected to the chair of Moral Philoſophy. His courſe of lectures on this ſubject was divided into four parts. The firſt contained Natural Theology; in which he conſidered the proofs of the being and attributes of GOD, and thoſe principles of the human mind upon which religion is founded. The ſecond comprehended *Ethics ſtrictly ſo called*, and conſiſted chiefly of the doctrines which he afterwards publiſhed in his Theory of Moral Sentiments. In the third part, he treated at more length of that branch of morality which relates to *juſtice*, and which, being ſuſceptible of preciſe and accurate rules, is for that reaſon capable of a full and particular explanation.

" Upon this ſubject he followed the plan that ſeems to be ſuggeſted by MONTESQUIEU; endeavouring to trace the gradual progreſs of juriſprudence, both public and private, from the rudeſt to the moſt refined ages, and to point out the effects of thoſe arts which contribute to ſubſiſtence, and to the accumulation of property, in producing correſpondent improvements or alterations in law and government. This important branch of his labours he alſo intended to give to the public; but this intention, which is mentioned in the concluſion of the Theory of Moral Sentiments, he did not live to fulfil.

" In the laſt part of his lectures, he examined thoſe political regulations which are founded, not upon the principle of *juſtice*, but that of *expediency*, and which are calculated to increaſe the riches, the power, and the proſperity of a State. Under this view, he conſidered the political inſtitutions relating to commerce, to finances, to eccleſiaſtical and military eſtabliſhments. What he delivered on theſe ſubjects contained the ſubſtance of the work he afterwards publiſhed under the title of An Inquiry into the Nature and Cauſes of the Wealth of Nations.

" There was no ſituation in which the abilities of Mr. SMITH appeared to greater advantage than as a Profeſſor. In delivering his lectures, he truſted almoſt entirely to extemporary elocution. His manner, though not graceful, was plain and unaffected; and as he ſeemed to be always intereſted in the ſubject, he never failed to intereſt his hearers. Each diſcourſe conſiſted commonly of ſeveral diſtinct propoſitions, which he ſucceſſively endeavoured to prove and illuſtrate. Theſe propoſitions, when announced in general terms, had, from their extent, not unfrequently ſomething of the air of a paradox. In his attempts to explain them, he often appeared, at firſt, not to be ſufficiently poſſeſſed of the ſubject, and ſpoke with ſome heſitation. As he advanced, however, the matter ſeemed to crowd upon him, his manner became warm and animated, and his expreſſion eaſy and fluent. In points ſuſceptible of controverſy, you could eaſily diſcern, that he ſecretly conceived an oppoſition to his opinions, and that he was led upon this account to ſupport them with greater energy and vehemence. By the fulneſs and variety of his illuſtrations, the ſubject gradually ſwelled in his hands, and acquired a dimenſion which, without a tedious repetition of the ſame views, was calculated to ſeize the attention of his audience, and to afford them pleaſure, as well as inſtruction, in following the ſame object,

object, through all the diverſity of ſhades and aſpects in which it was preſented, and afterwards in tracing it backwards to that original propoſition or general truth, from which this beautiful train of ſpeculation had proceeded.

"His reputation as a Profeſſor was accordingly raiſed very high, and a multitude of ſtudents from a great diſtance reſorted to the Univerſity, merely upon his account. Thoſe branches of ſcience which he taught became faſhionable at this place, and his opinions were the chief topics of diſcuſſion in clubs and literary ſocieties. Even the ſmall peculiarities in his pronunciation or manner of ſpeaking, became frequently the objects of imitation."

While Mr. Smith was thus diſtinguiſhing himſelf by his zeal and ability as a public teacher, he was gradually laying the foundation of a more extenſive reputation, by preparing for the preſs his ſyſtem of morals. The firſt edition of this work appeared in 1759, under the title of "The Theory of Moral Sentiments."

Hitherto Mr. Smith had remained unknown to the world as an author; nor have I heard that he had made a trial of his powers in any anonymous publications, excepting in a periodical work called *The Edinburgh Review*, which was begun in the year 1755, by ſome gentlemen of diſtinguiſhed abilities, but which they were prevented by other engagements from carrying farther than the two firſt numbers. To this work Mr. SMITH contributed a review of Dr. JOHNSON's Dictionary of the Engliſh Language, and alſo a letter, addreſſed to the editors, containing ſome general obſervations on the ſtate of literature in the different countries of Europe. In the former of theſe papers, he points out ſome defects in Dr. JOHNSON's plan, which he cenſures as not ſufficiently

grammatical. "The different ſignifications of a word (he obſerves) "are indeed collected; but they are ſeldom digeſted into general "claſſes, or ranged under the meaning which the word principally "expreſſes: And ſufficient care is not taken to diſtinguiſh the "words apparently ſynonymous." To illuſtrate this criticiſm, he copies from Dr. JOHNSON the articles BUT and HUMOUR, and oppoſes to them the ſame articles digeſted agreeably to his own idea. The various ſignifications of the word BUT are very nicely and happily diſcriminated. The other article does not ſeem to have been executed with equal care

The obſervations on the ſtate of learning in Europe are written with ingenuity and elegance; but are chiefly intereſting, as they ſhew the attention which the Author had given to the philoſophy and literature of the Continent, at a period when they were not much ſtudied in this iſland.

In the ſame volume with the Theory of Moral Sentiments, Mr. SMITH publiſhed a Diſſertation "on the Origin of Languages, and on the different Genius of thoſe which are original and compounded." The remarks I have to offer on theſe two diſcourſes, I ſhall, for the ſake of diſtinctneſs, make the ſubject of a ſeparate ſection.

SECTION II.

Of the Theory of Moral Sentiments, *and the* Diſſertation on the Origin of Languages.

THE ſcience of Ethics has been divided by modern writers into two parts; the one comprehending the theory of Morals, and the other its practical doctrines. The queſtions about which the former is employed, are chiefly the two following. *Firſt*, By what principle of our conſtitution are we led to form the notion of moral diſtinctions;—whether by that faculty which perceives the diſtinction between truth and falſehood; or by a peculiar power of perception, which is *pleaſed* with one ſet of qualities, and *diſpleaſed* with another? *Secondly*, What is the proper object of moral approbation; or, in other words, What is the common quality or qualities belonging to all the different modes of virtue? Is it benevolence; or a rational ſelf-love; or a diſpoſition to act ſuitably to the different relations in which we are placed? Theſe two queſtions ſeem to exhauſt the whole theory of Morals. The ſcope of the one is to aſcertain the origin of our moral ideas; that of the other, to refer the phenomena of moral perception to their moſt ſimple and general laws.

The practical doctrines of morality comprehend all thoſe rules of conduct which profeſs to point out the proper ends of human purſuit, and the moſt effectual means of attaining them; to which we may add all thoſe literary compoſitions, whatever be their particular form, which have for their aim to fortify and animate our good diſpoſitions, by delineations of the beauty, of the dignity, or of the utility of Virtue.

I ſhall not enquire at preſent into the juſtneſs of this diviſion. I ſhall only obſerve, that the words Theory and Practice are not,

in

in this inſtance, employed in their uſual acceptations. The theory of Morals does not bear, for example, the ſame relation to the practice of Morals, that the theory of geometry bears to practical geometry. In this laſt ſcience, all the practical rules are founded on theoretical principles previouſly eſtabliſhed: But in the former ſcience, the practical rules are obvious to the capacities of all mankind; the theoretical principles form one of the moſt difficult ſubjects of diſcuſſion that have ever exerciſed the ingenuity of metaphyſicians.

In illuſtrating the doctrines of practical morality, (if we make allowance for ſome unfortunate prejudices produced or encouraged by violent and oppreſſive ſyſtems of policy,) the antients ſeem to have availed themſelves of every light furniſhed by nature to human reaſon; and indeed thoſe writers who, in later times, have treated the ſubject with the greateſt ſucceſs, are they who have followed moſt cloſely the footſteps of the Greek and the Roman philoſophers. The theoretical queſtion, too, concerning the eſſence of virtue, or the proper *object* of moral approbation, was a favourite topic of diſcuſſion in the ancient ſchools. The queſtion concerning the *principle* of moral approbation, though not entirely of modern origin, has been chiefly agitated ſince the writings of Dr. CUDWORTH, in oppoſition to thoſe of Mr. HOBBES; and it is this queſtion accordingly, (recommended, at once, by its novelty and difficulty to the curioſity of ſpeculative men,) that has produced moſt of the theories which characteriſe and diſtinguiſh from each other the later ſyſtems of moral philoſophy.

It was the opinion of Dr. CUDWORTH, and alſo of Dr. CLARKE, that moral diſtinctions are perceived by that power of the mind which diſtinguiſhes truth from falſehood. This ſyſtem it was one great object of Dr. HUTCHESON's philoſophy to refute, and in oppoſition to it, to ſhew that the words Right and Wrong expreſs certain

certain agreeable and diſagreeable qualities in actions, which it is not the province of reaſon but of feeling to perceive; and to that power of perception which renders us ſuſceptible of pleaſure or of pain from the view of virtue or of vice, he gave the name of the Moral Senſe. His reaſonings upon this ſubject are in the main acquieſced in, both by Mr. HUME and Mr. SMITH; but they differ from him in one important particular,—Dr. HUTCHESON plainly ſuppoſing, that the moral ſenſe is a ſimple principle of our conſtitution, of which no account can be given; whereas the other two philoſophers have both attempted to analyſe it into other principles more general. Their ſyſtems, however, with reſpect to it are very different from each other. According to Mr. HUME, all the qualities which are denominated virtuous, are uſeful either to ourſelves or to others, and the pleaſure which we derive from the view of them is the pleaſure of utility. Mr. SMITH, without rejecting entirely Mr. HUME's doctrine, propoſes another of his own, far more comprehenſive; a doctrine with which he thinks all the moſt celebrated theories of morality invented by his predeceſſors coincide in part, and from ſome partial view of which he apprehends that they have all proceeded.

Of this very ingenious and original theory, I ſhall endeavour to give a ſhort abſtract. To thoſe who are familiarly acquainted with it as it is ſtated by its author, I am aware that the attempt may appear ſuperfluous; but I flatter myſelf that it will not be wholly uſeleſs to ſuch as have not been much converſant in theſe abſtract diſquiſitions, by preſenting to them the leading principles of the ſyſtem in one connected view, without thoſe interruptions of the attention which neceſſarily ariſe from the author's various and happy illuſtrations, and from the many eloquent digreſſions which animate and adorn his compoſition.

THE

THE fundamental principle of Mr. SMITH's theory is, that the primary objects of our moral perceptions are the actions of other men; and that our moral judgments with reſpect to our own conduct are only applications to ourſelves of deciſions which we have already paſſed on the conduct of our neighbour. His work accordingly conſiſts of two parts. In the former, he explains in what manner we learn to judge of the conduct of our neighbour; in the latter, in what manner, by applying theſe judgments to ourſelves, we acquire *a ſenſe of duty*.

Our moral judgments, both with reſpect to our own conduct and that of others, include two diſtinct perceptions: *firſt*, A perception of conduct as right or wrong: and, *ſecondly*, A perception of the merit or demerit of the agent. To that quality of conduct which moraliſts, in general, expreſs by the word Rectitude, Mr. SMITH gives the name of Propriety; and he begins his theory with enquiring in what it conſiſts, and how we are led to form the idea of it. The leading principles of his doctrine on this ſubject are comprehended in the following propoſitions:

1. It is from our own experience alone, that we can form any idea of what paſſes in the mind of another perſon on any particular occaſion; and the only way in which we can form this idea, is by ſuppoſing ourſelves in the ſame circumſtances with him, and conceiving how we ſhould be affected if we were ſo ſituated. It is impoſſible for us, however, to conceive ourſelves placed in any ſituation, whether agreeable or otherwiſe, without feeling an effect of the ſame kind with what would be produced by the ſituation itſelf; and of conſequence the attention we give at any time to the circumſtances of our neighbour, muſt affect us ſomewhat in the ſame manner, although by no means in the ſame degree, as if theſe circumſtances were our own.

That this imaginary change of place with other men, is the real ſource of the intereſt we take in their fortunes, Mr. SMITH attempts to prove by various inſtances. "When we ſee a ſtroke aimed, and "juſt ready to fall upon the leg or arm of another perſon, we "naturally ſhrink and draw back our own leg or our own arm; "and when it does fall, we feel it in ſome meaſure, and are hurt by "it as well as the ſufferer. The mob, when they are gazing at a "dancer on the ſlack rope, naturally writhe and twiſt and balance "their own bodies, as they ſee him do, and as they feel that they "themſelves muſt do if in his ſituation." The ſame thing takes place, according to Mr. SMITH, in every caſe in which our attention is turned to the condition of our neighbour. "Whatever is the paſ- "ſion which ariſes from any object in the perſon principally con- "cerned, an analogous emotion ſprings up, at the thought of his "ſituation, in the breaſt of every attentive ſpectator. In every "paſſion of which the mind of man is ſuſceptible, the emotions of "the by-ſtander always correſpond to what, by bringing the caſe home "to himſelf, he imagines ſhould be the ſentiments of the ſufferer."

To this principle of our nature which leads us to enter into the ſituations of other men, and to partake with them in the paſſions which theſe ſituations have a tendency to excite, Mr. SMITH gives the name of *ſympathy* or *fellow-feeling*, which two words he employs as ſynonymous. Upon ſome occaſions, he acknowledges, that ſympathy ariſes merely from the view of a certain emotion in another perſon; but in general it ariſes, not ſo much from the view of the emotion, as from that of the ſituation which excites it.

2. A ſympathy or fellow-feeling between different perſons is always agreeable to both. When I am in a ſituation which excites any paſſion, it is pleaſant to me to know, that the ſpectators of my ſituation enter with me into all its various circumſtances, and are

affected with them in the ſame manner as I am myſelf. On the other hand, it is pleaſant to the ſpectator to obſerve this correſpondence of his emotions with mine.

3. When the ſpectator of another man's ſituation, upon bringing home to himſelf all its various circumſtances, feels himſelf affected in the ſame manner with the perſon principally concerned, he approves of the affection or paſſion of this perſon as juſt and proper and ſuitable to its object. The exceptions which occur to this obſervation are, according to Mr. SMITH, only apparent. "A ſtranger, "for example, paſſes by us in the ſtreet with all the marks of the "deepeſt affliction; and we are immediately told, that he has juſt "received the news of the death of his father. It is impoſſible "that, in this caſe, we ſhould not approve of his grief; yet it may "often happen, without any defect of humanity on our part, that, "ſo far from entering into the violence of his ſorrow, we ſhould "ſcarce conceive the firſt movements of concern upon his account. "We have learned, however, from experience, that ſuch a misfor-"tune naturally excites ſuch a degree of ſorrow; and we know, "that if we took time to examine his ſituation fully and in all its "parts, we ſhould, without doubt, moſt ſincerely ſympathize with "him. It is upon the conſciouſneſs of this conditional ſympathy "that our approbation of his ſorrow is founded, even in thoſe caſes "in which that ſympathy does not actually take place; and the ge-"neral rules derived from our preceding experience of what our ſen-"timents would commonly correſpond with, correct upon this, as up-"on many other occaſions, the impropriety of our preſent emotions."

By the *propriety* therefore of any affection or paſſion exhibited by another perſon, is to be underſtood its ſuitableneſs to the object which excites it. Of this ſuitableneſs I can judge only from the coincidence of the affection with that which I feel, when I conceive myſelf

myſelf in the ſame circumſtances; and the perception of this coincidence is the foundation of the ſentiment of *moral approbation.*

4. Although, when we attend to the ſituation of another perſon, and conceive ourſelves to be placed in his circumſtances, an emotion of the ſame kind with that which he feels, naturally ariſes in our own mind, yet this ſympathetic emotion bears but a very ſmall proportion, in point of degree, to what is felt by the perſon principally concerned. In order, therefore, to obtain the pleaſure of mutual ſympathy, nature teaches the ſpectator to ſtrive as much as he can, to raiſe his emotion to a level with that which the object would really produce; and, on the other hand, ſhe teaches the perſon whoſe paſſion this object has excited, to bring it down, as much as he can, to a level with that of the ſpectator.

5. Upon theſe two different efforts are founded two different ſets of virtues. Upon the effort of the ſpectator to enter into the ſituation of the perſon principally concerned, and to raiſe his ſympathetic emotions to a level with the emotions of the actor, are founded the gentle, the amiable virtues; the virtues of candid condeſcenſion and indulgent humanity. Upon the effort of the perſon principally concerned to lower his own emotions, ſo as to correſpond as nearly as poſſible with thoſe of the ſpectator, are founded the great, the awful, and reſpectable virtues; the virtues of ſelf-denial, of ſelf-government, of that command of the paſſions, which ſubjects all the movements of our nature to what our own dignity and honour, and the propriety of our own conduct, require.

As a farther illuſtration of the foregoing doctrine, Mr. SMITH conſiders particularly the degrees of the different paſſions which are conſiſtent with propriety, and endeavours to ſhew, that in every caſe, it is decent or indecent to expreſs a paſſion ſtrongly, according as mankind are diſpoſed, or not diſpoſed to ſympathize with it. It is

unbecoming, for example, to expreſs ſtrongly any of thoſe paſſions which ariſe from a certain condition of the body; becauſe other men, who are not in the ſame condition, cannot be expected to ſympathize with them. It is unbecoming to cry out with bodily pain; becauſe the ſympathy felt by the ſpectator bears no proportion to the acuteneſs of what is felt by the ſufferer. The caſe is ſomewhat ſimilar with thoſe paſſions which take their origin from a particular turn or habit of the imagination.

In the caſe of the unſocial paſſions of hatred and reſentment, the ſympathy of the ſpectator is divided between the perſon who feels the paſſion, and the perſon who is the object of it. "We are concerned for both, and our fear for what the one may ſuffer damps "our reſentment for what the other has ſuffered." Hence the imperfect degree in which we ſympathize with ſuch paſſions; and the propriety, when we are under their influence, of moderating their expreſſion to a much greater degree than is required in the caſe of any other emotions.

The reverſe of this takes place with reſpect to all the ſocial and benevolent affections. The ſympathy of the ſpectator with the perſon who feels them, coincides with his concern for the perſon who is the object of them. It is this redoubled ſympathy which renders theſe affections ſo peculiarly becoming and agreeable.

The ſelfiſh emotions of grief and joy, when they are conceived on account of our own private good or bad fortune, hold a ſort of middle place between our ſocial and our unſocial paſſions. They are never ſo graceful as the one ſet, nor ſo odious as the other. Even when exceſſive, they are never ſo diſagreeable as exceſſive reſentment; becauſe no oppoſite ſympathy can ever intereſt us againſt them: and when moſt ſuitable to their objects, they are never ſo agreeable as impartial humanity and juſt benevolence; becauſe no double ſympathy can ever intereſt us for them.

After

After theſe general ſpeculations concerning the propriety of actions, Mr. SMITH examines how far the judgments of mankind concerning it are liable to be influenced in particular caſes, by the proſperous or the adverſe circumſtances of the agent. The ſcope of his reaſoning on this ſubject is directed to ſhew, (in oppoſition to the common opinion,) that when there is no envy in the caſe, our propenſity to ſympathize with joy is much ſtronger than our propenſity to ſympathize with ſorrow; and, of conſequence, that it is more eaſy to obtain the approbation of mankind in proſperity than in adverſity. From the ſame principle he traces the origin of ambition, or of the deſire of rank and pre-eminence; the great object of which paſſion is, to attain that ſituation which ſets a man moſt in the view of general ſympathy and attention, and gives him an eaſy empire over the affections of others

Having finiſhed the analyſis of our ſenſe of propriety and of impropriety, Mr. SMITH proceeds to conſider our ſenſe of merit and demerit; which he thinks has alſo a reference, in the firſt inſtance, not to our own characters, but to the characters of our neighbours. In explaining the origin of this part of our moral conſtitution, he avails himſelf of the ſame principle of ſympathy, into which he reſolves the ſentiment of moral approbation.

The words *propriety* and *impropriety*, when applied to an affection of the mind, are uſed in this theory (as has been already obſerved) to expreſs the ſuitableneſs or unſuitableneſs of the affection to its exciting *cauſe*. The words *merit* and *demerit* have always a reference (according to Mr. SMITH) to the *effect* which the affection tends to produce. When the tendency of an affection is beneficial, the agent appears to us a proper object of reward: when it is hurtful, he appears the proper object of puniſhment.

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The principles in our nature which moſt directly prompt us to reward and to puniſh, are gratitude and reſentment. To ſay of a perſon, therefore, that he is deſerving of reward or of puniſhment, is to ſay, in other words, that he is a proper object of gratitude or of reſentment; or, which amounts to the ſame thing, that he is to ſome perſon or perſons the object of a gratitude or of a reſentment, which every reaſonable man is ready to adopt and ſympathize with.

It is however very neceſſary to obſerve, that we do not thoroughly ſympathize with the gratitude of one man towards another, merely becauſe this other has been the cauſe of his good fortune, unleſs he has been the cauſe of it from motives which we entirely go along with. Our ſenſe, therefore, of the good deſert of an action, is a compounded ſentiment, made up of an indirect ſympathy with the perſon to whom the action is beneficial, and of a direct ſympathy with the affections and motives of the agent.——The ſame remark applies, *mutatis mutandis*, to our ſenſe of demerit, or of ill-deſert.

From theſe principles, it is inferred, that the only actions which appear to us deſerving of reward, are actions of a beneficial tendency, proceeding from proper motives; the only actions which ſeem to deſerve puniſhment, are actions of a hurtful tendency, proceeding from improper motives. A mere want of beneficence expoſes to no puniſhment; becauſe the mere want of beneficence tends to do no real poſitive evil. A man, on the other hand, who is barely innocent, and contents himſelf with obſerving ſtrictly the laws of juſtice with reſpect to others, can merit only, that his neighbours, in their turn, ſhould obſerve religiouſly the ſame laws with reſpect to him.

These observations lead Mr. SMITH to anticipate a little the ſubject of the ſecond great diviſion of his work, by a ſhort enquiry into

into the origin of our ſenſe of juſtice *as applicable to our own conduct*; and alſo of our ſentiments of remorſe, and of good deſert.

The origin of our ſenſe of juſtice, as well as of all our other moral ſentiments, he accounts for by means of the principle of ſympathy. When I attend only to the feelings of my own breaſt, my own happineſs appears to me of far greater conſequence than that of all the world beſides. But I am conſcious, that in this exceſſive preference, other men cannot poſſibly ſympathize with me, and that to them I appear only one of the crowd, in whom they are no more intereſted than in any other individual. If I wiſh, therefore, to ſecure their ſympathy and approbation, (which, according to Mr. SMITH, are the objects of the ſtrongeſt deſire of my nature,) it is neceſſary for me to regard my happineſs, not in that light in which it appears to myſelf, but in that light in which it appears to *mankind in general*. If an unprovoked injury is offered to me, I know that ſociety will ſympathize with my reſentment; but if I injure the intereſts of another, who never injured me, merely becauſe they ſtand in the way of my own, I perceive evidently, that ſociety will ſympathize with *his* reſentment, and that I ſhall become the object of general indignation.

When, upon any occaſion, I am led by the violence of paſſion to overlook theſe conſiderations, and, in the caſe of a competition of intereſts, to act according to my own feelings, and not according to thoſe of impartial ſpectators, I never fail to incur the puniſhment of remorſe. When my paſſion is gratified, and I begin to reflect coolly on my conduct, I can no longer enter into the motives from which it proceeded; it appears as improper to me as to the reſt of the world; I lament the effects it has produced; I pity the unhappy ſufferer whom I have injured; and I feel myſelf a juſt object of indignation to mankind. "Such, ſays Mr. SMITH, is the

"nature

" nature of that ſentiment which is properly called remorſe. It is " made up of ſhame from the ſenſe of the impropriety of paſt con- " duct; of grief for the effects of it; of pity for thoſe who ſuffer by " it; and of the dread and terror of puniſhment from the conſciouſ- " neſs of the juſtly provoked reſentment of all rational creatures."

The oppoſite behaviour of him who, from proper motives, has performed a generous action, inſpires, in a ſimilar manner, the oppoſite ſentiment of conſcious merit, or of deſerved reward.

The foregoing obſervations contain a general ſummary of Mr. SMITH's principles with reſpect to the origin of our moral ſentiments, in ſo far at leaſt as they relate to the conduct of others. He acknowledges, at the ſame time, that the ſentiments of which we are conſcious, on particular occaſions, do not always coincide with theſe principles; and that they are frequently modified by other conſiderations very different from the propriety or impropriety of the affections of the agent, and alſo from the beneficial or hurtful tendency of theſe affections. The good or the bad conſequences which accidentally follow from an action, and which, as they do not depend on the agent, ought undoubtedly, in point of juſtice, to have no influence on our opinion, either of the propriety or the merit of his conduct, ſcarcely ever fail to influence conſiderably our judgment with reſpect to both; by leading us to form a good or a bad opinion of the prudence with which the action was performed, and by animating our ſenſe of the merit or demerit of his deſign. Theſe facts, however, do not furniſh any objections which are peculiarly applicable to Mr. SMITH's theory; for whatever hypotheſis we may adopt with reſpect to the origin of our moral perceptions, all men muſt acknowledge, that in ſo far as the proſperous or the unproſperous event of an action depends on fortune or on accident, it ought neither to increaſe nor to diminiſh

our moral approbation or diſapprobation of the agent. And accordingly it has, in all ages of the world, been the complaint of moraliſts, that the actual ſentiments of mankind ſhould ſo often be in oppoſition to this equitable and indiſputable maxim. In examining, therefore, this irregularity of our moral ſentiments, Mr. SMITH is to be conſidered, not as obviating an objection peculiar to his own ſyſtem, but as removing a difficulty which is equally connected with every theory on the ſubject which has ever been propoſed. So far as I know, he is the firſt philoſopher who has been fully aware of the importance of the difficulty, and he has indeed treated it with great ability and ſucceſs. The explanation which he gives of it is not warped in the leaſt by any peculiarity in his own ſcheme; and, I muſt own, it appears to me to be the moſt ſolid and valuable improvement he has made in this branch of ſcience. It is impoſſible to give any abſtract of it in a ſketch of this kind; and therefore I muſt content myſelf with remarking, that it conſiſts of three parts. The firſt explains the cauſes of this irregularity of ſentiment; the ſecond, the extent of its influence; and the third, the important purpoſes to which it is ſubſervient. His remarks on the laſt of theſe heads are more particularly ingenious and pleaſing; as their object is to ſhew, in oppoſition to what we ſhould be diſpoſed at firſt to apprehend, that when nature implanted the ſeeds of this irregularity in the human breaſt, her leading intention was to promote the happineſs and perfection of the ſpecies.

The remaining part of Mr. SMITH's theory is employed in ſhewing, in what manner *our ſenſe of duty* comes to be formed, in conſequence of an application to ourſelves of the judgments we have previouſly paſſed on the conduct of others.

In entering upon this enquiry, which is undoubtedly the moſt important in the work, and for which the foregoing ſpeculations

are, according to Mr. SMITH's theory, a neceſſary preparation, he begins with ſtating *the fact* concerning our conſciouſneſs of merited praiſe or blame; and it muſt be owned, that the firſt aſpect of the fact, as he himſelf ſtates it, appears not very favourable to his principles. That the great object of a wiſe and virtuous man is not to act in ſuch a manner as to obtain the actual approbation of thoſe around him, but to act ſo as to render himſelf the *juſt* and *proper* object of their approbation, and that his ſatisfaction with his own conduct depends much more on the conſciouſneſs of *deſerving* this approbation than from that of really enjoying it, he candidly acknowledges; but ſtill he inſiſts, that although this may ſeem, at firſt view, to intimate the exiſtence of ſome moral faculty which is not borrowed from without, our moral ſentiments have always ſome ſecret reference, either to what are, or to what upon a certain condition would be, or to what we imagine ought to be, the ſentiments of others; and that if it were poſſible, that a human creature could grow up to manhood without any communication with his own ſpecies, he could no more think of his own character, or of the propriety or demerit of his own ſentiments and conduct, than of the beauty or deformity of his own face. There is indeed a tribunal within the breaſt, which is the ſupreme arbiter of all our actions, and which often mortifies us amidſt the applauſe, and ſupports us under the cenſure of the world; yet ſtill, he contends, that if we enquire into the origin of its inſtitution, we ſhall find, that its juriſdiction is, in a great meaſure, derived from the authority of that very tribunal whoſe deciſions it ſo often and ſo juſtly reverſes.

When we firſt come into the world, we, for ſome time, fondly purſue the impoſſible project of gaining the good-will and approbation of every body. We ſoon however find, that this univerſal approbation is unattainable; that the moſt equitable conduct muſt

frequently thwart the intereſts or the inclinations of particular perſons, who will ſeldom have candour enough to enter into the propriety of our motives, or to ſee that this conduct, how diſagreeable ſoever to them, is perfectly ſuitable to our ſituation. In order to defend ourſelves from ſuch partial judgments, we ſoon learn to ſet up in our own minds, a judge between ourſelves and thoſe we live with. We conceive ourſelves as acting in the preſence of a perſon, who has no particular relation, either to ourſelves, or to thoſe whoſe intereſts are affected by our conduct; and we ſtudy to act in ſuch a manner as to obtain the approbation of this ſuppoſed impartial ſpectator. It is only by conſulting him that we can ſee whatever relates to ourſelves in its proper ſhape and dimenſions.

There are two different occaſions, on which we examine our own conduct, and endeavour to view it in the light in which the impartial ſpectator would view it. Firſt, when we are about to act; and, ſecondly, after we have acted. In both caſes, our views are very apt to be partial.

When we are about to act, the eagerneſs of paſſion ſeldom allows us to conſider what we are doing with the candour of an indifferent perſon. When the action is over, and the paſſions which prompted it have ſubſided, although we can undoubtedly enter into the ſentiments of the indifferent ſpectator much more coolly than before, yet it is ſo diſagreeable to us to think ill of ourſelves, that we often purpoſely turn away our view from thoſe circumſtances which might render our judgment unfavourable.—Hence that ſelf-deceit which is the ſource of half the diſorders of human life.

In order to guard ourſelves againſt its deluſions, nature leads us to form inſenſibly, by our continual obſervations upon the conduct of others, certain general rules concerning what is fit and proper either

to be done or avoided. Some of their actions ſhock all our natural ſentiments; and when we obſerve other people affected in the ſame manner with ourſelves, we are confirmed in the belief, that our diſapprobation was juſt. We naturally therefore lay it down as a general rule, that all ſuch actions are to be avoided, as tending to render us odious, contemptible, or puniſhable; and we endeavour, by habitual reflection, to fix this general rule in our minds, in order to correct the miſrepreſentations of ſelf-love, if we ſhould ever be called on to act in ſimilar circumſtances. The man of furious reſentment, if he were to liſten to the dictates of that paſſion, would perhaps regard the death of his enemy as but a ſmall compenſation for a trifling wrong. But his obſervations on the conduct of others have taught him how horrible ſuch ſanguinary revenges are; and he has impreſſed it on his mind as an invariable rule, to abſtain from them upon all occaſions. This rule preſerves its authority with him, checks the impetuoſity of his paſſion, and corrects the partial views which ſelf-love ſuggeſts; although, if this had been the firſt time in which he conſidered ſuch an action, he would undoubtedly have determined it to be juſt and proper, and what every impartial ſpectator would approve of.—A regard to ſuch general rules of morality conſtitutes, according to Mr. SMITH, what is properly called *the ſenſe of duty*.

I before hinted, that Mr. SMITH does not reject entirely from his ſyſtem that principle of *utility*, of which the perception in any action or character conſtitutes, according to Mr. HUME, the ſentiment of moral approbation. That no qualities of the mind are approved of as virtues, but ſuch as are uſeful or agreeable, either to the perſon himſelf or to others, he admits to be a propoſition that holds univerſally; and he alſo admits, that the ſentiment of approbation with which we regard virtue, is enlivened by the perception of this utility, or, as he explains the fact, it is enlivened by our

our ſympathy with the happineſs of thoſe to whom the utility extends: But ſtill he inſiſts, that it is not the view of this utility which is either the firſt or principal ſource of moral approbation.

To ſum up the whole of his doctrine in a few words. "When "we approve of any character or action, the ſentiments which we "feel are derived from four different ſources. Firſt, we ſympa- "thize with the motives of the agent; ſecondly, we enter into the "gratitude of thoſe who receive the benefit of his actions; thirdly, "we obſerve that his conduct has been agreeable to the general "rules by which thoſe two ſympathies generally act; and, laſtly, "when we conſider ſuch actions as making a part of a ſyſtem of "behaviour which tends to promote the happineſs either of the indi- "vidual or of ſociety, they appear to derive a beauty from this "utility, not unlike that which we aſcribe to any well-contrived "machine." Theſe *different* ſentiments, he thinks, exhauſt completely, in every inſtance that can be ſuppoſed, the compounded ſentiment of moral approbation. "After deducting, ſays he, in "any one particular caſe, all that muſt be acknowledged to proceed "from ſome one or other of theſe four principles, I ſhould be glad "to know what remains; and I ſhall freely allow this overplus to "be aſcribed to a moral ſenſe, or to any other peculiar faculty, "provided any body will aſcertain preciſely what this overplus is."

Mr. SMITH's opinion concerning the nature of virtue, is involved in his theory concerning the principle of moral approbation. The idea of virtue, he thinks, always implies the idea of propriety, or of the ſuitableneſs of the affection to the object which excites it; which ſuitableneſs, according to him, can be determined in no other way than by the ſympathy of impartial ſpectators with the motives or the agent. But ſtill he apprehends, that this deſcription of virtue is incomplete; for although in every virtuous action pro-

priety

priety is an eſſential ingredient, it is not always the ſole ingredient. Beneficent actions have in them another quality, by which they appear, not only to deſerve approbation, but recompence, and excite a ſuperior degree of eſteem, ariſing from a double ſympathy with the motives of the agent, and the gratitude of thoſe who are the objects of his affection. In this reſpect, beneficence appears to him to be diſtinguiſhed from the inferior virtues of prudence, vigilance, circumſpection, temperance, conſtancy, firmneſs, which are always regarded with approbation, but which confer no merit. This diſtinction, he apprehends, has not been ſufficiently attended to by moraliſts; the principles of ſome affording no explanation of the approbation we beſtow on the inferior virtues; and thoſe of others accounting as imperfectly for the peculiar excellency which the ſupreme virtue of beneficence is acknowledged to poſſeſs.

Such are the outlines of Mr. SMITH's Theory of Moral Sentiments; a work which, whatever opinion we may entertain of the juſtneſs of its concluſions, muſt be allowed by all to be a ſingular effort of invention, ingenuity, and ſubtilty. For my own part I muſt confeſs, that it does not coincide with my notions concerning the foundation of Morals; but I am convinced, at the ſame time, that it contains a large mixture of important truth, and that, although the author has ſometimes been miſled by too great a deſire of generalizing his principles, he has had the merit of directing the attention of philoſophers to a view of human nature which had formerly in a great meaſure eſcaped their notice. Of the great proportion of juſt and ſound reaſoning which the theory involves, its ſtriking plauſibility is a ſufficient proof; for as the author himſelf has remarked, no ſyſtem in morals can well gain our aſſent, if it does not border, in ſome reſpects, upon the truth. "A ſyſtem of "natural philoſophy, (he obſerves,) may appear very plauſible, and "be for a long time very generally received in the world, and

"yet

" yet have no foundation in nature; but the author who ſhould " aſſign as the cauſe of any natural ſentiment, ſome principle which " neither had any connection with it, nor reſembled any other " principle which had ſome connection, would appear abſurd and " ridiculous to the moſt injudicious and unexperienced reader." The merit, however, of Mr. SMITH's performance does not reſt here. No work, undoubtedly, can be mentioned, ancient or modern, which exhibits ſo complete a view of thoſe facts with reſpect to our moral perceptions, which it is one great object of this branch of ſcience to refer to their general laws; and upon this account, it well deſerves the careful ſtudy of all whoſe taſte leads them to proſecute ſimilar enquiries. Theſe facts are indeed frequently expreſſed in a language which involves the author's peculiar theories: But they are always preſented in the moſt happy and beautiful lights; and it is eaſy for an attentive reader, by ſtripping them of hypothetical terms, to ſtate them to himſelf with that logical preciſion, which, in ſuch very difficult diſquiſitions, can alone conduct us with certainty to the truth.

It is proper to obſerve farther, that with the theoretical doctrines of the book, there are every where interwoven, with ſingular taſte and addreſs, the pureſt and moſt elevated maxims concerning the practical conduct of life; and that it abounds throughout with intereſting and inſtructive delineations of characters and manners. A conſiderable part of it too is employed in collateral enquiries, which, upon every hypotheſis that can be formed concerning the foundation of morals, are of equal importance. Of this kind is the ſpeculation formerly mentioned, with reſpect to the influence of fortune on our moral ſentiments, and another ſpeculation, no leſs valuable, with reſpect to the influence of cuſtom and faſhion on the ſame part of our conſtitution

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The ſtyle in which Mr. SMITH has conveyed the fundamental principles on which his theory reſts, does not ſeem to me to be ſo perfectly ſuited to the ſubject as that which he employs on moſt other occaſions. In communicating ideas which are extremely abſtract and ſubtile, and about which it is hardly poſſible to reaſon correctly, without the ſcrupulous uſe of appropriated terms, he ſometimes preſents to us a choice of words, by no means ſtrictly ſynonymous, ſo as to divert the attention from a preciſe and ſteady conception of his propoſition; and a ſimilar effect is, in other inſtances, produced by that diverſity of forms which, in the courſe of his copious and ſeducing compoſition, the ſame truth inſenſibly aſſumes. When the ſubject of his work leads him to addreſs the imagination and the heart; the variety and felicity of his illuſtrations; the richneſs and fluency of his eloquence; and the ſkill with which he wins the attention and commands the paſſions of his readers, leave him, among our Engliſh moraliſts, without a rival.

THE Diſſertation on the Origin of Languages, which now forms a part of the ſame volume with the Theory of Moral Sentiments, was, I believe, firſt annexed to the ſecond edition of that work. It is an eſſay of great ingenuity, and on which the author himſelf ſet a high value; but, in a general review of his publications, it deſerves our attention leſs, on account of the opinions it contains, than as a ſpecimen of a particular ſort of enquiry, which, ſo far as I know, is entirely of modern origin, and which ſeems, in a peculiar degree, to have intereſted Mr. SMITH's curioſity. Something very ſimilar to it may be traced in all his different works, whether moral, political, or literary; and on all theſe ſubjects he has exemplified it with the happieſt ſucceſs.

When,

When, in ſuch a period of ſociety as that in which we live, we compare our intellectual acquirements, our opinions, manners, and inſtitutions, with thoſe which prevail among rude tribes, it cannot fail to occur to us as an intereſting queſtion, by what gradual ſteps the tranſition has been made from the firſt ſimple efforts of uncultivated nature, to a ſtate of things ſo wonderfully artificial and complicated. Whence has ariſen that ſyſtematical beauty which we admire in the ſtructure of a cultivated language; that analogy which runs through the mixture of languages ſpoken by the moſt remote and unconnected nations; and thoſe peculiarities by which they are all diſtinguiſhed from each other? Whence the origin of the different ſciences and of the different arts; and by what chain has the mind been led from their firſt rudiments to their laſt and moſt refined improvements? Whence the aſtoniſhing fabric of the political union; the fundamental principles which are common to all governments; and the different forms which civilized ſociety has aſſumed in different ages of the world? On moſt of theſe ſubjects very little information is to be expected from hiſtory; for long before that ſtage of ſociety when men begin to think of recording their tranſactions, many of the moſt important ſteps of their progreſs have been made. A few inſulated facts may perhaps be collected from the caſual obſervations of travellers, who have viewed the arrangements of rude nations; but nothing, it is evident, can be obtained in this way, which approaches to a regular and connected detail of human improvement.

In this want of direct evidence, we are under a neceſſity of ſupplying the place of fact by conjecture; and when we are unable to aſcertain how men have actually conducted themſelves upon particular occaſions, of conſidering in what manner they are likely to have proceeded, from the principles of their nature, and the circumſtances of their external ſituation. In ſuch enquiries, the detached

tached facts which travels and voyages afford us, may frequently ſerve as land-marks to our ſpeculations; and ſometimes our concluſions *a priori*, may tend to confirm the credibility of facts, which, on a ſuperficial view, appeared to be doubtful or incredible.

Nor are ſuch theoretical views of human affairs ſubſervient merely to the gratification of curioſity. In examining the hiſtory of mankind, as well as in examining the phenomena of the material world, when we cannot trace the proceſs by which an event *has been* produced, it is often of importance to be able to ſhew how it *may have been* produced by natural cauſes. Thus, in the inſtance which has ſuggeſted theſe remarks, although it is impoſſible to determine with certainty what the ſteps were by which any particular language was formed, yet if we can ſhew, from the known principles of human nature, how all its various parts might gradually have ariſen, the mind is not only to a certain degree ſatisfied, but a check is given to that indolent philoſophy, which refers to a miracle, whatever appearances, both in the natural and moral worlds, it is unable to explain.

To this ſpecies of philoſophical inveſtigation, which has no appropriated name in our language, I ſhall take the liberty of giving the title of *Theoretical* or *Conjectural Hiſtory*; an expreſſion which coincides pretty nearly in its meaning with that of *Natural Hiſtory*, as employed by Mr. HUME *, and with what ſome French writers have called *Hiſtoire Raiſonnée*.

The mathematical ſciences, both pure and mixed, afford, in many of their branches, very favourable ſubjects for theoretical hiſtory; and a very competent judge, the late M. d'ALEMBERT, has recommend-

* See his Natural Hiſtory of Religion.

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ed this arrangement of their elementary principles, which is founded on the natural ſucceſſion of inventions and diſcoveries, as the beſt adapted for intereſting the curioſity and exerciſing the genius of ſtudents. The ſame author points out as a model a paſſage in MONTUCLA's Hiſtory of Mathematics, where an attempt is made to exhibit the gradual progreſs of philoſophical ſpeculation, from the firſt concluſions ſuggeſted by a general ſurvey of the heavens, to the doctrines of COPERNICUS. It is ſomewhat remarkable, that a theoretical hiſtory of this very ſcience (in which we have, perhaps, a better opportunity than in any other inſtance whatever, of comparing the natural advances of the mind with the actual ſucceſſion of hypothetical ſyſtems) was one of Mr. SMITH's earlieſt compoſitions, and is one of the very ſmall number of his manuſcripts which he did not deſtroy before his death

I already hinted, that enquiries perfectly analagous to theſe may be applied to the modes of government, and to the municipal inſtitutions which have obtained among different nations. It is but lately, however, that theſe important ſubjects have been conſidered in this point of view; the greater part of politicians before the time of MONTESQUIEU, having contented themſelves with an hiſtorical ſtatement of facts, and with a vague reference of laws to the wiſdom of particular legiſlators, or to accidental circumſtances, which it is now impoſſible to aſcertain. MONTESQUIEU, on the contrary, conſidered laws as originating chiefly from the circumſtances of ſociety; and attempted to account, from the changes in the condition of mankind, which take place in the different ſtages of their progreſs, for the correſponding alterations which their inſtitutions undergo. It is thus, that in his occaſional elucidations of the Roman juriſprudence, inſtead of bewildering himſelf among the erudition of ſcholiaſts and of antiquaries, we frequently find him borrowing his lights from the moſt remote and unconnected quarters of the

globe, and combining the caſual obſervations of illiterate travellers and navigators, into a philoſophical commentary on the hiſtory of law and of manners.

The advances made in this line of enquiry ſince MONTESQUIEU's time have been great. Lord KAMES, in his Hiſtorical Law Tracts, has given ſome excellent ſpecimens of it, particularly in his Eſſays on the Hiſtory of Property and of Criminal Law, and many ingenious ſpeculations of the ſame kind occur in the works of Mr. MILLAR.

In Mr. SMITH's writings, whatever be the nature of his ſubject, he ſeldom miſſes an opportunity of indulging his curioſity, in tracing from the principles of human nature, or from the circumſtances of ſociety, the origin of the opinions and the inſtitutions which he deſcribes. I formerly mentioned a fragment concerning the Hiſtory of Aſtronomy which he has left for publication; and I have heard him ſay more than once, that he had projected, in the earlier part of his life, a hiſtory of the other ſciences on the ſame plan. In his Wealth of Nations, various diſquiſitions are introduced which have a like object in view, particularly the theoretical delineation he has given of the natural progreſs of opulence in a country; and his inveſtigation of the cauſes which have inverted this order in the different countries of modern Europe. His lectures on juriſprudence ſeem, from the account of them formerly given, to have abounded in ſuch enquiries.

I am informed by the ſame gentleman who favoured me with the account of Mr. SMITH's lectures at Glaſgow, that he had heard him ſometimes hint an intention of writing a treatiſe upon the Greek and Roman republics. "And after all that has been publiſhed on "that ſubject, I am convinced (ſays he), that the obſervations of

'Mr.

"Mr. SMITH would have ſuggeſted many new and important "views concerning the internal and domeſtic circumſtances of thoſe "nations, which would have diſplayed their ſeveral ſyſtems of po- "licy, in a light much leſs artificial than that in which they have hi- "therto appeared."

The ſame turn of thinking was frequently, in his ſocial hours, applied to more familiar ſubjects; and the fanciful theories which, without the leaſt affectation of ingenuity, he was continually ſtarting upon all the common topics of diſcourſe, gave to his converſation a novelty and variety that were quite inexhauſtible. Hence too the minuteneſs and accuracy of his knowledge on many trifling articles which, in the courſe of his ſpeculations, he had been led to conſider from ſome new and intereſting point of view; and of which his lively and circumſtantial deſcriptions amuſed his friends the more, that he ſeemed to be habitually inattentive, in ſo remarkable a degree, to what was paſſing around him.

I have been led into theſe remarks by the Diſſertation on the Formation of Languages, which exhibits a very beautiful ſpecimen of theoretical hiſtory, applied to a ſubject equally curious and difficult. The analogy between the train of thinking from which it has taken its riſe, and that which has ſuggeſted a variety of his other diſquiſitions, will, I hope, be a ſufficient apology for the length of this digreſſion; more particularly, as it will enable me to ſimplify the account which I am to give afterwards, of his enquiries concerning political œconomy.

I ſhall only obſerve farther on this head, that when different theoretical hiſtories are propoſed by different writers, of the progreſs of the human mind in any one line of exertion, theſe theories are not always

always to be underſtood as ſtanding in oppoſition to each other. If the progreſs delineated in all of them be plauſible, it is poſſible at leaſt, that they may all have been realized; for human affairs never exhibit, in any two inſtances, a perfect uniformity. But whether they have been realized or no, is often a queſtion of little conſequence. In moſt caſes, it is of more importance to aſcertain the progreſs that is moſt ſimple, than the progreſs that is moſt agreeable to fact; for, paradoxical as the propoſition may appear, it is certainly true, that the real progreſs is not always the moſt natural. It may have been determined by particular accidents, which are not likely again to occur, and which cannot be conſidered as forming any part of that general proviſion which nature has made for the improvement of the race.

In order to make ſome amends for the length (I am afraid I may add for the tedioufneſs) of this ſection, I ſhall ſubjoin to it an original letter of Mr. Hume's, addreſſed to Mr. Smith, ſoon after the publication of his Theory. It is ſtrongly marked with that eaſy and affectionate pleaſantry which diſtinguiſhed Mr. Hume's epiſtolary correſpondence, and is entitled to a place in this Memoir, on account of its connection with an important event of Mr. Smith's life, which ſoon after removed him into a new ſcene, and influenced, to a conſiderable degree, the ſubſequent courſe of his ſtudies. The letter is dated from London, 12th April 1759.

"I give you thanks for the agreeable preſent of your Theory. Wedderburn and I made preſents of our copies to ſuch of our acquaintances as we thought good judges, and proper to ſpread the

reputation of the book. I ſent one to the Duke of ARGYLE, to Lord LYTTLETON, HORACE WALPOLE, SOAME JENNYNS, and BURKE, an Iriſh gentleman, who wrote lately a very pretty treatiſe on the Sublime. MILLAR deſired my permiſſion to ſend one in your name to Dr. WARBURTON. I have delayed writing to you till I could tell you ſomething of the ſucceſs of the book, and could prognoſticate with ſome probability, whether it ſhould be finally damned to oblivion, or ſhould be regiſtered in the temple of immortality. Though it has been publiſhed only a few weeks, I think there appear already ſuch ſtrong ſymptoms, that I can almoſt venture to foretel its fate. It is in ſhort this———— But I have been interrupted in my letter by a fooliſh impertinent viſit of one who has lately come from Scotland. He tells me that the Univerſity of Glaſgow intend to declare ROUET's office vacant, upon his going abroad with Lord HOPE. I queſtion not but you will have our friend FERGUSON in your eye, in caſe another project for procuring him a place in the Univerſity of Edinburgh ſhould fail. FERGUSON has very much poliſhed and improved his treatiſe on Refinement *, and with ſome amendments it will make an admirable book, and diſcovers an elegant and a ſingular genius. The Epigoniad, I hope, will do; but it is ſomewhat up-hill work. As I doubt not but you conſult the reviews ſometimes at preſent, you will ſee in the Critical Review a letter upon that poem; and I deſire you to employ your conjectures in finding out the author. Let me ſee a ſample of your ſkill in knowing hands by your gueſſing at the perſon. I am afraid of Lord KAMES's Law Tracts. A man might as well think of making a fine ſauce by a mixture of wormwood and aloes, as an agreeable compoſition by joining metaphyſics and Scotch law. However, the book, I believe, has merit; though few people will take the pains of diving into it. But, to return to your book,

* Publiſhed afterwards under the title of "An Eſſay on the Hiſtory of Civil Society."

and

and its ſucceſs in this town, I muſt tell you———— A plague of interruptions! I ordered myſelf to be denied; and yet here is one that has broke in upon me again. He is a man of letters, and we have had a good deal of literary converſation. You told me that you was curious of literary anecdotes, and therefore I ſhall inform you of a few that have come to my knowledge. I believe I have mentioned to you already HELVETIUS's book *de l'Eſprit*. It is worth your reading, not for its philoſophy, which I do not highly value, but for its agreeable compoſition. I had a letter from him a few days ago, wherein he tells me that my name was much oftener in the manuſcript, but that the Cenſor of books at Paris obliged him to ſtrike it out. VOLTAIRE has lately publiſhed a ſmall work called *Candide, ou l'Optimiſme*. I ſhall give you a detail of it———— But what is all this to my book? ſay you.—My dear Mr. SMITH, have patience: Compoſe yourſelf to tranquillity: Shew yourſelf a philoſopher in practice as well as profeſſion: Think on the emptineſs, and raſhneſs, and futility of the common judgments of men: How little they are regulated by reaſon in any ſubject, much more in philoſophical ſubjects, which ſo far exceed the comprehenſion of the vulgar.

———— *Non ſi quid turbida Roma,*
Elevet, accedas: examenve improbum in illa
Caſtiges trutina: nec te quæſiveris extra.

A wiſe man's kingdom is his own breaſt; or, if he ever looks farther, it will only be to the judgment of a ſelect few, who are free from prejudices, and capable of examining his work. Nothing indeed can be a ſtronger preſumption of falſehood than the approbation of the multitude; and PHOCION, you know, always ſuſpected himſelf of ſome blunder, when he was attended with the applauſes of the populace.

Suppoſing

"Suppoſing, therefore, that you have duly prepared yourſelf for the worſt by all theſe reflections, I proceed to tell you the melancholy news, that your book has been very unfortunate; for the public ſeem diſpoſed to applaud it extremely. It was looked for by the fooliſh people with ſome impatience; and the mob of literati are beginning already to be very loud in its praiſes. Three Biſhops called yeſterday at MILLAR's ſhop in order to buy copies, and to aſk queſtions about the author. The Biſhop of PETERBOROUGH ſaid he had paſſed the evening in a company where he heard it extolled above all books in the world. The Duke of ARGYLE is more deciſive than he uſes to be in its favour. I ſuppoſe he either conſiders it as an exotic, or thinks the author will be ſerviceable to him in the Glaſgow elections. Lord LYTTLELON ſays, that ROBERTSON and SMITH and BOWER are the glories of Engliſh literature. OSWALD proteſts he does not know whether he has reaped more inſtruction or entertainment from it. But you may eaſily judge what reliance can be put on his judgment, who has been engaged all his life in public buſineſs, and who never ſees any faults in his friends. MILLAR exults and brags that two thirds of the edition are already ſold, and that he is now ſure of ſucceſs. You ſee what a ſon of the earth that is, to value books only by the profit they bring him. In that view, I believe it may prove a very good book.

"CHARLES TOWNSEND, who paſſes for the cleyereſt fellow in England, is ſo taken with the performance, that he ſaid to OSWALD he would put the Duke of BUCCLEUGH under the author's care, and would make it worth his while to accept of that charge. As ſoon as I heard this, I called on him twice, with a view of talking with him about the matter, and of convincing him of the propriety of ſending that young Nobleman to Glaſgow: For I could not hope, that he could offer you any terms which would tempt you to renounce your Profeſſorſhip: But I miſſed him. Mr. TOWNSEND

paſſes for being a little uncertain in his reſolutions; ſo perhaps you need not build much on this ſally.

"In recompence for ſo many mortifying things, which nothing but truth could have extorted from me, and which I could eaſily have multiplied to a greater number, I doubt not but you are ſo good a Chriſtian as to return good for evil; and to flatter my vanity by telling me, that all the godly in Scotland abuſe me for my account of JOHN KNOX and the Reformation. I ſuppoſe you are glad to ſee my paper end, and that I am obliged to conclude with

Your Humble Servant,

DAVID HUME."

SECTION III.

From the Publication of The Theory of Moral Sentiments, *till that of* The Wealth of Nations

AFTER the publication of the Theory of Moral Sentiments, Mr. SMITH remained four years at Glaſgow, diſcharging his official duties with unabated vigour, and with increaſing reputation. During that time, the plan of his lectures underwent a conſiderable change. His ethical doctrines, of which he had now publiſhed ſo valuable a part, occupied a much ſmaller portion of the courſe than formerly: and accordingly, his attention was naturally directed to a more complete illuſtration of the principles of juriſprudence and of political œconomy.

To this laſt ſubject, his thoughts appear to have been occaſionally turned from a very early period of life. It is probable, that the un-

interrupted friendſhip he had always maintained with his old companion Mr. OSWALD had ſome tendency to encourage him in proſecuting this branch of his ſtudies; and the publication of Mr. HUME's political diſcourſes in the year 1752, could not fail to confirm him in thoſe liberal views of commercial policy which had already opened to him in the courſe of his own enquiries. His long reſidence in one of the moſt enlightened mercantile towns in this iſland, and the habits of intimacy in which he lived with the moſt reſpectable of its inhabitants, afforded him an opportunity of deriving what commercial information he ſtood in need of, from the beſt ſources; and it is a circumſtance no leſs honourable to their liberality than to his talents, that notwithſtanding the reluctance ſo common among men of buſineſs to liſten to the concluſions of mere ſpeculation, and the direct oppoſition of his leading principles to all the old maxims of trade, he was able, before he quitted his ſituation in the Univerſity, to rank ſome very eminent merchants in the number of his proſelytes *.

Among the ſtudents who attended his lectures, and whoſe minds were not previouſly warped by prejudice, the progreſs of his opinions, it may be reaſonably ſuppoſed, was much more rapid. It was his claſs of his friends accordingly that firſt adopted his ſyſtem with eagerneſs, and diffuſed a knowledge of its fundamental principles over this part of the kingdom.

Towards the end of 1763, MR. SMITH received an invitation from Mr. CHARLES TOWNSEND to accompany the DUKE of BUCCLEUGH on his travels; and the liberal terms in which the propoſal was made to him, added to the ſtrong deſire he had felt of viſiting the Continent of Europe, induced him to reſign his office at

* I mention this fact on the reſpectable authority of JAMES RITCHIE, Eſq. of Glaſgow.

Glaſgow. With the connection which he was led to form in conſequence of this change in his ſituation, he had reaſon to be ſatisfied in an uncommon degree, and he always ſpoke of it with pleaſure and gratitude. To the public, it was not perhaps a change equally fortunate; as it interrupted that ſtudious leiſure for which nature ſeems to have deſtined him, and in which alone he could have hoped to accompliſh thoſe literary projects which had flattered the ambition of his youthful genius.

The alteration, however, which, from this period, took place in his habits, was not without its advantages. He had hitherto lived chiefly within the walls of an Univerſity; and although to a mind like his, the obſervation of human nature on the ſmalleſt ſcale is ſufficient to convey a tolerably juſt conception of what paſſes on the great theatre of the world, yet it is not to be doubted, that the variety of ſcenes through which he afterwards paſſed, muſt have enriched his mind with many new ideas, and corrected many of thoſe miſapprehenſions of life and manners which the beſt deſcriptions of them can ſcarcely fail to convey.—But whatever were the lights that his travels afforded to him as a ſtudent of human nature, they were probably uſeful in a ſtill greater degree, in enabling him to perfect that ſyſtem of political œconomy, of which he had already delivered the principles in his lectures at Glaſgow, and which it was now the leading object of his ſtudies to prepare for the public. The coincidence between ſome of theſe principles and the diſtinguiſhing tenets of the French œconomiſts, who were at that very time in the height of their reputation, and the intimacy in which he lived with ſome of the leaders of that ſect, could not fail to aſſiſt him in methodizing and digeſting his ſpeculations; while the valuable collection of facts, accumulated by the zealous induſtry of their numerous adherents, furniſhed him with ample materials for illuſtrating and confirming his theoretical concluſions.

After

After leaving Glaſgow, Mr. SMITH joined the Duke of BUCCLEUGH at London early in the year 1764, and ſet out with him for the Continent in the month of March following. At Dover they were met by Sir JAMES MACDONALD, who accompanied them to Paris, and with whom Mr. SMITH laid the foundation of a friendſhip, which he always mentioned with great ſenſibility, and of which he often lamented the ſhort duration. The panegyrics with which the memory of this accompliſhed and amiable perſon has been honoured by ſo many diſtinguiſhed characters in the different countries of Europe, are a proof how well fitted his talents were to command general admiration. The eſteem in which his abilities and learning were held by Mr. SMITH, is a teſtimony to his extraordinary merit of ſtill ſuperior value. Mr. HUME, too, ſeems, in this inſtance, to have partaken of his friend's enthuſiaſm. "Were you and I toge-"ther, (ſays he in a letter to Mr. SMITH,) we ſhould ſhed tears at "preſent for the death of poor Sir JAMES MACDONALD. We "could not poſſibly have ſuffered a greater loſs than in that valuable "young man."

In this firſt viſit to Paris, the Duke of BUCCLEUGH and Mr. SMITH employed only ten or twelve days*, after which they proceeded

* The day after his arrival at Paris, Mr. SMITH ſent a formal reſignation of his Profeſſorſhip to the Rector of the Univerſity of Glaſgow. "I never was more anx-"ious (ſays he in the concluſion of this letter) for the good of the College, than at "this moment; and I ſincerely wiſh, that whoever is my ſucceſſor may not only do-"credit to the office by his abilities, but be a comfort to the very excellent men with-"whom he is likely to ſpend his life, by the probity of his heart, and the goodneſs of "his temper."

The following extract from the records of the Univerſity, which follows immediately after Mr. SMITH's letter of reſignation, is at once a teſtimony to his aſſiduity as a Profeſſor, and a proof of the juſt ſenſe which that learned body entertained of the talents and worth of the colleague they had loſt:

"The meeting accept of Dr. SMITH's reſignation, in terms of the above letter, "and the office of Profeſſor of Moral Philoſophy in this Univerſity is therefore hereby "declared

ceeded to Thoulouſe, where they fixed their reſidence for eighteen months; and where, in addition to the pleaſure of an agreeable ſociety, Mr. SMITH had an opportunity of correcting and extending his information concerning the internal policy of France, by the intimacy in which he lived with ſome of the principal perſons of the Parliament.

From Thoulouſe they went, by a pretty extenſive tour, through the ſouth of France to Geneva. Here they paſſed two months. The late Earl STANHOPE, for whoſe learning and worth Mr. SMITH entertained a ſincere reſpect, was then an inhabitant of that republic.

About Chriſtmas 1765, they returned to Paris, and remained there till October following. The ſociety in which Mr. SMITH ſpent theſe ten months, may be conceived from the advantages he enjoyed, in conſequence of the recommendations of Mr. HUME. TURGOT, QUESNAI, NECKER, d'ALEMBERT, HELVETIUS, MARMONTEL, Madame RICCOBONI, were among the number of his acquaintances; and ſome of them he continued ever afterwards to reckon among his friends. From Madame d'ANVILLE, the reſpectable mother of the late excellent and much lamented Duke of ROCHEFOUCAULD *, he received many attentions, which he always recollected with particular gratitude.

It

"declared to be vacant. The Univerſity, at the ſame time, cannot help expreſſing "their ſincere regret at the removal of Dr. SMITH, whoſe diſtinguiſhed probity and "amiable qualities procured him the eſteem and affection of his colleagues; and "whoſe uncommon genius, great abilities, and extenſive learning, did ſo much honour "to this ſociety; his elegant and ingenious Theory of Moral Sentiments having re-"commended him to the eſteem of men of taſte and literature throughout Europe. "His happy talent in illuſtrating abſtracted ſubjects, and faithful aſſiduity in commu-"nicating uſeful knowledge, diſtinguiſhed him as a Profeſſor, and at once afforded the "greateſt pleaſure and the moſt important inſtruction to the youth under his care."

* The following letter, which has been very accidentally preſerved, while it ſerves as a memorial of Mr. SMITH's connection with the family of ROCHEFOUCAULD, is ſo expreſſive

It is much to be regretted, that he preſerved no journal of this very intereſting period of his hiſtory; and ſuch was his averſion to

preſſive of the virtuous and liberal mind of the writer, that I am perſuaded it will give pleaſure to the ſociety to record it in their Tranſactions.

Paris, 3. *Mars* 1778.

"Le deſir de ſe rappeller à votre ſouvenir, Monſieur, quand on a eu l'honneur de vous connoître, doit vous paroître fort naturel; permettez que nous ſaiſiſſions pour cela, ma Mère et moi, l'occaſion d'une edition nouvelle des *Maximes de la Rochefoucauld*, dont nous prenons la liberté de vous offrir un exemplaire. Vous voyez que nous n'avons point de rancune, puiſque le mal que vous avez dit de lui dans la *Théorie des Sentimens Moraux*, ne nous empeche point de vous envoier ce même ouvrage. Il s'en eſt même fallu de peu que je ne fiſſe encore plus, car j'avois eu peutêtre la témérité d'entreprendre une traduction de votre *Théorie*; mais comme je venois de terminer la premiere partie, j'ai vû paroître la traduction de M. l'Abbé BLAVET, et j'ai été forcé de renoncer au plaiſir que j'aurois eu de faire paſſer dans ma langue un des meilleurs ouvrages de la vôtre.

"Il auroit bien fallu pour lors entreprendre une juſtification de mon grandpère. Peutêtre n'auroit-il pas été difficile, premierement de l'excuſer, en diſant, qu'il avoit toujours vu les hommes à la Cour, et dans la guerre civile, *deux thèatres ſur leſquels ils ſont certainement plus mauvais qu'ailleurs*; et enſuite de juſtifier par la conduite perſonelle de l'auteur, les principes qui ſont certainement trop généraliſés dans ſon ouvrage. Il a pris la partie pour le tout; et parceque les gens qu'il avoit eu le plus ſous les yeux étoient animés par *l'amour propre*, il en a fait le mobile général de tous les hommes. Au reſte, quoique ſon ouvrage merite à certains égards d'être combattu, il eſt cependant eſtimable même pour le fond, et beaucoup pour la forme.

"Permettez moi de vous demander, ſi nous aurons bientôt une édition complette des œuvres de votre illuſtre ami M. HUME? Nous l'avons ſincèrement regretté.

"Recevez, je vous ſupplie, l'expreſſion ſincère de tous les ſentimens d'eſtime et d'attachement avec leſquels j'ai l'honneur d'être, Monſieur, votre très humble at très obeiſſant ſerviteur,

Le Duc de la ROCHEFOUCAULD."

Mr. SMITH's laſt intercourſe with this excellent man was in the year 1789, when he informed him by means of a friend who happened to be then at Paris, that in the future editions of his *Theory* the name of ROCHEFOUCAULD ſhould be no longer claſſed with that of MANDEVILLE. In the enlarged edition accordingly of that work, publiſhed a ſhort time before his death, he has ſuppreſſed his cenſure of the author of the *Maximes*; who ſeems indeed (however exceptionable many of his principles may be) to have been

to write letters, that I ſcarcely ſuppoſe any memorial of it exiſts in his correſpondence with his friends. The extent and accuracy of his memory, in which he was equalled by few, made it of little conſequence to himſelf to record in writing what he heard or ſaw; and from his anxiety before his death to deſtroy all the papers in his poſſeſſion, he ſeems to have wiſhed, that no materials ſhould remain for his biographers, but what were furniſhed by the laſting monuments of his genius, and the exemplary worth of his private life.

The ſatisfaction he enjoyed in the converſation of TURGOT may be eaſily imagined. Their opinions on the moſt eſſential points of political œconomy were the ſame; and they were both animated by the ſame zeal for the beſt intereſts of mankind. The favourite ſtudies, too, of both had directed their enquiries to ſubjects on which the underſtandings of the ableſt and the beſt informed are liable to be warped, to a great degree, by prejudice and paſſion; and on which, of conſequence, a coincidence of judgment is peculiarly gratifying. We are told by one of the biographers of TURGOT, that after his retreat from the miniſtry, he occupied his leiſure in a philoſophical correſpondence with ſome of his old friends; and, in particular, that various letters on important ſubjects paſſed between him and Mr. SMITH. I take notice of this anecdote chiefly as a proof of the intimacy which was underſtood to have ſubſiſted between them; for in other reſpects, the anecdote ſeems to me to be ſomewhat doubtful. It is ſcarcely to be ſuppoſed, that Mr. SMITH would deſtroy the letters of ſuch a correſpondent as TURGOT; and ſtill leſs probable, that ſuch an intercourſe was carried on between them without the knowledge of any of Mr. SMITH's friends. From ſome

been actuated, both in his life and writings, by motives very different from thoſe of MANDEVILLE. The real ſcope of theſe maxims is placed, I think, in a juſt light by the ingenious author of the *notice* prefixed to the edition of them publiſhed at Paris in 1778

enquiries

enquiries that have been made at Paris by a gentleman of this Society ſince M. SMITH's death, I have reaſon to believe, that no evidence of the correſpondence exiſts among the papers of M. TURGOT, and that the whole ſtory has taken its riſe from a report ſuggeſted by the knowledge of their former intimacy. This circumſtance I think it of importance to mention, becauſe a good deal of curioſity has been excited by the paſſage in queſtion, with reſpect to the fate of the ſuppoſed letters.

Mr. SMITH was alſo well known to M. QUESNAI, the profound and original author of the Oeconomical Table; a man (according to Mr. SMITH's account of him) "of the greateſt modeſty and ſim-"plicity;" and whoſe ſyſtem of political œconomy he has pronounced, "with all its imperfections," to be "the neareſt approxi-"mation to the truth that has yet been publiſhed on the principles "of that very important ſcience." If he had not been prevented by QUESNAI's death, Mr. SMITH had once an intention (as he told me himſelf) to have inſcribed to him his "Wealth of Nations."

It was not, however, merely the diſtinguiſhed men who about this period fixed ſo ſplendid an æra in the literary hiſtory of France, that excited Mr. SMITH's curioſity while he remained in Paris. His acquaintance with the polite literature both of ancient and modern times was extenſive; and amidſt his various other occupations, he had never neglected to cultivate a taſte for the fine arts;---leſs, it is probable, with a view to the peculiar enjoyments they convey, (though he was by no means without ſenſibility to their beauties,) than on account of their connection with the general principles of the human mind; to an examination of which they afford the moſt pleaſing of all avenues. To thoſe who ſpeculate on this very delicate ſubject, a compariſon of the modes of taſte that prevail among different nations, affords a valuable collection of facts; and Mr.

SMITH, who was always diſpoſed to aſcribe to cuſtom and faſhion their full ſhare in regulating the opinions of mankind with reſpect to beauty, may naturally be ſuppoſed to have availed himſelf of every opportunity which a foreign country afforded him of illuſtrating his former theories.

Some of his peculiar notions, too, with reſpect to the imitative arts, ſeem to have been much confirmed by his obſervations while abroad. In accounting for the pleaſure we receive from theſe arts, it had early occurred to him as a fundamental principle, that a very great part of it ariſes from the difficulty of the imitation; a principle which was probably ſuggeſted to him by that of the *difficulté ſurmontée*, by which ſome French critics had attempted to explain the effect of verſification and of rhyme *. This principle Mr. SMITH puſhed to the greateſt poſſible length, and referred to it, with ſingular ingenuity, a great variety of phenomena in all the different fine arts. It led him, however, to ſome concluſions, which appear, at firſt view at leaſt, not a little paradoxical; and I cannot help thinking, that it warped his judgment in many of the opinions which he was accuſtomed to give on the ſubject of poetry.

The principles of dramatic compoſition had more particularly attracted his attention; and the hiſtory of the theatre, both in ancient and modern times, had furniſhed him with ſome of the moſt remarkable facts on which his theory of the imitative arts was founded. From this theory it ſeemed to follow as a conſequence, that the ſame circumſtances which, in tragedy, give to blank verſe an advantage over proſe, ſhould give to rhyme an advantage over blank verſe; and Mr. SMITH had always inclined to that opinion. Nay, he had gone ſo far as to extend the ſame doctrine to comedy; and

* See the Preface to VOLTAIRE's *Oedipe*, Edit. of. 1729.

to regret that thoſe excellent pictures of life and manners which the Engliſh ſtage affords, had not been executed after the model of the French ſchool. The admiration with which he regarded the great dramatic authors of France tended to confirm him in theſe opinions; and this admiration (reſulting originally from the general character of his taſte, which delighted more to remark that pliancy of genius which accommodates itſelf to eſtabliſhed rules, than to wonder at the bolder flights of an undiſciplined imagination) was increaſed to a great degree, when he ſaw the beauties that had ſtruck him in the cloſet, heightened by the utmoſt perfection of theatrical exhibition. In the laſt years of his life, he ſometimes amuſed himſelf, at a leiſure hour, in ſupporting his theoretical concluſions on theſe ſubjects, by the facts which his ſubſequent ſtudies and obſervations had ſuggeſted; and he intended, if he had lived, to have prepared the reſult of theſe labours for the preſs. Of this work he has left for publication a ſhort fragment; but he had not proceeded far enough to apply his doctrine to verſification and to the theatre. As his notions, however, with reſpect to theſe were a favourite topic of his converſation, and were intimately connected with his general principles of criticiſm, it would have been improper to paſs them over in this ſketch of his life; and I even thought it proper to detail them at greater length than the comparative importance of the ſubject would have juſtified, if he had carried his plans into execution. Whether his love of ſyſtem, added to his partiality for the French drama, may not have led him, in this inſtance, to generalize a little too much his concluſions, and to overlook ſome peculiarities in the language and verſification of that country, I ſhall not take upon me to determine.

In October 1766, the Duke of BUCCLEUGH returned to London. His Grace, to whom I am indebted for ſeveral particulars in the

foregoing narrative, will, I hope, forgive the liberty I take in tranſcribing one paragraph in his own words: "In October 1766, we "returned to London, after having ſpent near three years together, "without the ſlighteſt diſagreement or coolneſs;—on my part, with "every advantage that could be expected from the ſociety of ſuch "a man. We continued to live in friendſhip till the hour of his "death; and I ſhall always remain with the impreſſion of having "loſt a friend whom I loved and reſpected, not only for his great "talents, but for every private virtue."

The retirement in which Mr. SMITH paſſed his next ten years, formed a ſtriking contraſt to the unſettled mode of life he had been for ſome time accuſtomed to, but was ſo congenial to his natural diſpoſition, and to his firſt habits, that it was with the utmoſt difficulty he was ever perſuaded to leave it. During the whole of this period, (with the exception of a few viſits to Edinburgh and London,) he remained with his mother at Kirkaldy; occupied habitually in intenſe ſtudy, but unbending his mind at times in the company of ſome of his old ſchool-fellows, whoſe "ſober wiſhes" had attached them to the place of their birth. In the ſociety of ſuch men, Mr. SMITH delighted; and to them he was endeared, not only by his ſimple and unaſſuming manners, but by the perfect knowledge they all poſſeſſed of thoſe domeſtic virtues which had diſtinguiſhed him from his infancy.

Mr. HUME, who (as he tells us himſelf) conſidered "a town as "the true ſcene for a man of letters," made many attempts to ſeduce him from his retirement. In a letter, dated in 1772, he urges him to paſs ſome time with him in Edinburgh. "I ſhall not take "any excuſe from your ſtate of health, which I ſuppoſe only a "ſubterfuge invented by indolence and love of ſolitude. Indeed, "my dear SMITH, if you continue to hearken to complaints of this

"nature

" nature, you will cut yourſelf out entirely from human ſociety, to the " great loſs of both parties." In another letter, dated in 1769, from his houſe in James's Court, (which commanded a proſpect of the frith of Forth, and of the oppoſite coaſt of Fife,) " I am glad " (ſays he) to have come within ſight of you; but as I would alſo be " within ſpeaking terms of you, I wiſh we could concert meaſures " for that purpoſe. I am mortally ſick at ſea, and regard with " horror and a kind of hydrophobia the great gulph that lies be- " tween us. I am alſo tired of travelling, as much as you ought " naturally to be of ſtaying at home. I therefore propoſe to you " to come hither, and paſs ſome days with me in this ſolitude. I " want to know what you have been doing, and propoſe to exact a " rigorous account of the method in which you have employed " yourſelf during your retreat. I am poſitive you are in the wrong " in many of your ſpeculations, eſpecially where you have the miſ- " fortune to differ from me. All theſe are reaſons for our meeting, " and I wiſh you would make me ſome reaſonable propoſal for that " purpoſe. There is no habitation in the iſland of Inchkeith, other- " wiſe I ſhould challenge you to meet me on that ſpot, and neither " of us ever to leave the place, till we were fully agreed on all points " of controverſy. I expect General CONWAY here to-morrow, " whom I ſhall attend to Roſeneath, and I ſhall remain there a few " days. On my return, I hope to find a letter from you, contain- " ing a bold acceptance of this defiance."

At length (in the beginning of the year 1776) Mr. SMITH accounted to the world for his long retreat, by the publication of his " Inquiry into the Nature and Cauſes of the Wealth of Nations." A letter of congratulation on this event, from Mr. HUME, is now before me. It is dated 1ſt April 1776, (about ſix months before Mr. HUME's death,) and diſcovers an amiable ſolicitude about his friend's

friend's literary fame. "*Euge! Belle!* Dear Mr. SMITH; I am much "pleaſed with your performance, and the peruſal of it has taken "me from a ſtate of great anxiety. It was a work of ſo much "expectation, by yourſelf, by your friends, and by the public, "that I trembled for its appearance; but am now much relieved. "Not but that the reading of it neceſſarily requires ſo much attention, "and the public is diſpoſed to give ſo little, that I ſhall ſtill doubt "for ſome time of its being at firſt very popular. But it has depth "and ſolidity and acuteneſs, and is ſo much illuſtrated by curious "facts, that it muſt at laſt take the public attention. It is probably "much improved by your laſt abode in London. If you were here "at my fire-ſide, I ſhould diſpute ſome of your principles. . . . . "But theſe, and a hundred other points, "are fit only to be diſcuſſed in converſation. I hope it will be ſoon; "for I am in a very bad ſtate of health, and cannot afford a long "delay."

Of a book which is now ſo univerſally known as "The Wealth "of Nations," it might be conſidered perhaps as ſuperfluous to give a particular analyſis; and at any rate, the limits of this eſſay make it impoſſible for me to attempt it at preſent. A few remarks, however, on the object and tendency of the work, may, I hope, be introduced without impropriety. The hiſtory of a Philoſopher's life can contain little more than the hiſtory of his ſpeculations; and in the caſe of ſuch an author as Mr. SMITH, whoſe ſtudies were ſyſtematically directed from his youth to ſubjects of the laſt importance to human happineſs, a review of his writings, while it ſerves to illuſtrate the peculiarities of his genius, affords the moſt faithful picture of his character as a man.

SECTION IV.

Of The Inquiry into the Nature and Cauſes of the Wealth of Nations *.

AN hiſtorical review of the different forms under which human affairs have appeared in different ages and nations, naturally ſuggeſts the queſtion, Whether the experience of former times may not now furniſh ſome general principles to enlighten and direct the policy of future legiſlators? The diſcuſſion, however, to which this queſtion leads is of ſingular difficulty; as it requires an accurate analyſis of by far the moſt complicated claſs of phænomena that can poſſibly engage our attention, thoſe which reſult from the intricate and often the imperceptible mechaniſm of political ſociety;—a ſubject of obſervation which ſeems, at firſt view, ſo little commenſurate to our faculties, that it has been generally regarded with the ſame paſſive emotions of wonder and ſubmiſſion, with which, in the material world, we ſurvey the effects produced, by the myſterious and uncontroulable operation of phyſical cauſes. It is fortunate that upon this, as on many other occaſions, the difficulties which had long baffled the efforts of ſolitary genius begin to appear leſs formidable to the united exertions of the race; and that in proportion as the experience and the reaſonings of different individuals are brought to bear upon the ſame objects, and are combined in ſuch a manner as to illuſtrate and to limit each other, the

* The length to which this Memoir has already extended, together with ſome other reaſons which it is unneceſſary to mention here, have induced me, in printing the following ſection, to confine myſelf to a much more general view of the ſubject than I once intended.

ſcience

ſcience of politics aſſumes more and more that ſyſtematical form which encourages and aids the labours of future enquirers.

In proſecuting the ſcience of politics on this plan, little aſſiſtance is to be derived from the ſpeculations of ancient philoſophers, the greater part of whom, in their political enquiries, confined their attention to a compariſon of different forms of government, and to an examination of the proviſions they made for perpetuating their own exiſtence, and for extending the glory of the ſtate. It was reſerved for modern times to inveſtigate thoſe univerſal principles of juſtice and of expediency, which ought, under every form of government, to regulate the ſocial order; and of which the object is, to make as equitable a diſtribution as poſſible, among all the different members of a community, of the advantages ariſing from the political union.

The invention of printing was perhaps neceſſary to prepare the way for theſe reſearches. In thoſe departments of literature and of ſcience, where genius finds within itſelf the materials of its labours; in poetry, in pure geometry, and in ſome branches of moral philoſophy; the ancients have not only laid the foundations on which we are to build, but have left great and finiſhed models for our imitation. But in phyſics, where our progreſs depends on an immenſe collection of facts, and on a combination of the accidental lights daily ſtruck out in the innumerable walks of obſervation and experiment; and in politics, where the materials of our theories are equally ſcattered, and are collected and arranged with ſtill greater difficulty, the means of communication afforded by the preſs have, in the courſe of two centuries, accelerated the progreſs of the human mind, far beyond what the moſt ſanguine hopes of our predeceſſors could have imagined.

The

The progreſs already made in this ſcience, inconſiderable as it is in compariſon of what may be yet expected, has been ſufficient to ſhew, that the happineſs of mankind depends, not on the ſhare which the people poſſeſſes, directly or indirectly, in the enactment of laws, but on the equity and expediency of the laws that are enacted. The ſhare which the people poſſeſſes in the government is intereſting chiefly to the ſmall number of men whoſe object is the attainment of political importance; but the equity and expediency of the laws are intereſting to every member of the community: and more eſpecially to thoſe whoſe perſonal inſignificance leaves them no encouragement, but what they derive from the general ſpirit of the government under which they live.

It is evident, therefore, that the moſt important branch of political ſcience is that which has for its object to aſcertain the philoſophical principles of juriſprudence; or (as Mr. SMITH expreſſes it) to aſcertain "the general principles which ought to run through and "be the foundation of the laws of all nations *." In countries, where the prejudices of the people are widely at variance with theſe principles, the political liberty which the conſtitution beſtows, only furniſhes them with the means of accompliſhing their own ruin: And if it were poſſible to ſuppoſe theſe principles completely realized in any ſyſtem of laws, the people would have little reaſon to complain, that they were not immediately inſtrumental in their enactment. The only infallible criterion of the excellence of any conſtitution is to be found in the detail of its municipal code; and the value which wiſe men ſet on political freedom, ariſes chiefly from the facility it is ſuppoſed to afford, for the introduction of thoſe legiſlative improvements which the general intereſts of the community

* See the concluſion of his Theory of Moral Sentiments.

recommend.—I cannot help adding, that the capacity of a people to exerciſe political rights with utility to themſelves and to their country, preſuppoſes a diffuſion of knowledge and of good morals, which can only reſult from the previous operation of laws favourable to induſtry, to order, and to freedom.

Of the truth of theſe remarks, enlightened politicians ſeem now to be in general convinced; for the moſt celebrated works which have been produced in the different countries of Europe, during the laſt thirty years, by SMITH, QUESNAI, TURGOT, CAMPOMANES, BECCARIA, and others, have aimed at the improvement of ſociety,—not by delineating plans of new conſtitutions, but by enlightening the policy of actual legiſlators. Such ſpeculations, while they are more eſſentially and more extenſively uſeful than any others, have no tendency to unhinge eſtabliſhed inſtitutions, or to inflame the paſſions of the multitude. The improvements they recommend are to be effected by means too gradual and ſlow in their operation, to warm the imaginations of any but of the ſpeculative few; and in proportion as they are adopted, they conſolidate the political fabric, and enlarge the baſis upon which it reſts.

To direct the policy of nations with reſpect to one moſt important claſs of its laws, thoſe which form its ſyſtem of political œconomy, is the great aim of Mr. SMITH's *Inquiry*: And he has unqueſtionably had the merit of preſenting to the world, the moſt comprehenſive and perfect work that has yet appeared, on the general principles of any branch of legiſlation. The example which he has ſet will be followed, it is to be hoped, in due time, by other writers, for whom the internal policy of ſtates furniſhes many other ſubjects of diſcuſſion no leſs curious and intereſting; and may accelerate the progreſs of that ſcience which Lord BACON has ſo well deſcribed in

the following paſſage: " Finis et ſcopus quem leges intueri, atque " ad quem juſſiones et ſanctiones ſuas dirigere debent, non alius eſt, " quam ut cives feliciter degant: id fiet, ſi pietate et religione recte " inſtituti; moribus honeſti; armis adverſus hoſtes externos tuti; " legum auxilio adverſus ſeditiones et privatas injurias muniti; im- " perio et magiſtratibus obſequentes; copiis et opibus locupletes et " florentes fuerint.——Certe cognitio iſta ad viros civiles proprie " ſpectat; qui optime nôrunt, quid ferat ſocietas humana, quid ſalus " populi, quid æquitas naturalis, quid gentium mores, quid rerum- " publicarum formæ diverſæ: ideoque poſſint de legibus, ex prin- " cipiis et præceptis tam æquitatis naturalis, quam politices decer- " nere. Quamobrem id nunc agatur, ut fontes juſtitiæ et utilitatis " publicæ petantur, et in ſingulis juris partibus character quidam " et idea juſti exhibeatur, ad quam particularium regnorum et " rerumpublicarum leges probare, atque inde emendationem moliri, " quiſque, cui hoc cordi erit et curæ, poſſit." The enumeration contained in the foregoing paſſage, of the different objects of law, coincides very nearly with that given by Mr. SMITH in the concluſion of his Theory of Moral Sentiments; and the preciſe aim of the political ſpeculations which he then announced, and of which he afterwards publiſhed ſo valuable a part in his Wealth of Nations, was to aſcertain the general principles of juſtice and of expediency, which ought to guide the inſtitutions of legiſlators on theſe important articles;—in the words of Lord BACON, to aſcertain thoſe *leges legum*, " ex quibus informatio peti poſſit, quid in ſingulis legibus " bene aut perperam poſitum aut conſtitutum ſit.'

The branch of legiſlation which Mr. SMITH has made choice of as the ſubject of his work, naturally leads me to remark a very ſtriking contraſt between the ſpirit of ancient and of modern policy

in reſpect to the Wealth of Nations *. The great object of the former was to counteract the love of money and a taſte for luxury, by poſitive inſtitutions; and to maintain in the great body of the people, habits of frugality, and a ſeverity of manners. The decline of ſtates is uniformly aſcribed by the philoſophers and hiſtorians, both of Greece and Rome, to the influence of riches on national character; and the laws of LYCURGUS, which, during a courſe of ages, baniſhed the precious metals from Sparta, are propoſed by many of them as the moſt perfect model of legiſlation deviſed by human wiſdom.—How oppoſite to this is the doctrine of modern politicians! Far from conſidering poverty as an advantage to a ſtate, their great aim is to open new ſources of national opulence, and to animate the activity of all claſſes of the people by a taſte for the comforts and accommodations of life.

One principal cauſe of this difference between the ſpirit of ancient and of modern policy, may be found in the difference between the ſources of national wealth in ancient and in modern times. In ages when commerce and manufactures were yet in their infancy, and among ſtates conſtituted like moſt of the ancient republics, a ſudden influx of riches from abroad was juſtly dreaded as an evil, alarming to the morals, to the induſtry, and to the freedom of a people. So different, however, is the caſe at preſent, that the moſt wealthy nations are thoſe where the people are the moſt laborious, and where they enjoy the greateſt degree of liberty. Nay, it was the general diffuſion of wealth among the lower orders of men, which firſt gave birth to the ſpirit of independence in modern Europe, and which has produced under ſome of its governments,

* Science de la Legiſlation, par le Chev. FILANGIERI, Liv. i. chap. 13.

and

and eſpecially under our own, a more equal diffuſion of freedom and of happineſs than took place under the moſt celebrated conſtitutions of antiquity.

Without this diffuſion of wealth among the lower orders, the important effects reſulting from the invention of printing would have been extremely limited; for a certain degree of eaſe and independence is neceſſary to inſpire men with the deſire of knowledge, and to afford them the leiſure which is requiſite for acquiring it; and it is only by the rewards which ſuch a ſtate of ſociety holds up to induſtry and ambition, that the ſelfiſh paſſions of the multitude can be intereſted in the intellectual improvement of their children. The extenſive propagation of light and refinement ariſing from the influence of the preſs, aided by the ſpirit of commerce, ſeems to be the remedy provided by nature, againſt the fatal effects which would otherwiſe be produced, by the ſubdiviſion of labour accompanying the progreſs of the mechanical arts: Nor is any thing wanting to make the remedy effectual, but wiſe inſtitutions to facilitate general inſtruction, and to adapt the education of individuals to the ſtations they are to occupy. The mind of the artiſt, which, from the limited ſphere of his activity, would ſink below the level of the peaſant or the ſavage, might receive in infancy the means of intellectual enjoyment, and the ſeeds of moral improvement; and even the inſipid uniformity of his profeſſional engagements, by preſenting no object to awaken his ingenuity or to diſtract his attention, might leave him at liberty to employ his faculties, on ſubjects more intereſting to himſelf, and more extenſively uſeful to others.

Theſe effects, notwithſtanding a variety of oppoſing cauſes which ſtill exiſt, have already reſulted, in a very ſenſible degree, from the liberal

liberal policy of modern times. Mr. HUME, in his Eſſay on Commerce, after taking notice of the numerous armies raiſed and maintained by the ſmall republics in the ancient world, aſcribes the military power of theſe ſtates to their want of commerce and luxury. "Few artiſans were maintained by the labour of the farmers, and "therefore more ſoldiers might live upon it." He adds, however, that "the policy of ancient times was VIOLENT, and contrary to the "NATURAL courſe of things;"—by which, I preſume, he means, that it aimed too much at modifying, by the force of poſitive inſtitutions, the order of ſociety, according to ſome preconceived idea of expediency; without truſting ſufficiently to thoſe principles of the human conſtitution, which, wherever they are allowed free ſcope, not only conduct mankind to happineſs, but lay the foundation of a progreſſive improvement in their condition and in their character. The advantages which modern policy poſſeſſes over the ancient, ariſe principally from its conformity, in ſome of the moſt important articles of political œconomy, to an order of things recommended by nature; and it would not be difficult to ſhew, that where it remains imperfect, its errors may be traced to the reſtraints it impoſes on the natural courſe of human affairs. Indeed, in theſe reſtraints may be diſcovered the latent ſeeds of many of the prejudices and follies which infect modern manners, and which have ſo long bid defiance to the reaſonings of the philoſopher and the ridicule of the ſatiriſt.

The foregoing very imperfect hints appeared to me to form, not only a proper, but in ſome meaſure a neceſſary introduction to the few remarks I have to offer on Mr. SMITH's Inquiry; as they tend to illuſtrate a connection between his ſyſtem of commercial politics, and thoſe ſpeculations of his earlier years, in which he aimed more profeſſedly

profeſſedly at the advancement of human improvement and happineſs. It is this view of political œconomy that can alone render it intereſting to the moraliſt, and can dignify calculations of profit and loſs in the eye of the philoſopher. Mr. SMITH has alluded to it in various paſſages of his work, but he has no where explained himſelf fully on the ſubject; and the great ſtreſs he has laid on the effects of the diviſion of labour in increaſing its productive powers ſeems, at firſt ſight, to point to a different and very melancholy concluſion;—that the ſame cauſes which promote the progreſs of the arts, tend to degrade the mind of the artiſt; and, of conſequence, that the growth of national wealth implies a ſacrifice of the character of the people.

The fundamental doctrines of Mr. SMITH's ſyſtem are now ſo generally known, that it would have been tedious to offer any recapitulation of them in this place; even if I could have hoped to do juſtice to the ſubject, within the limits which I have preſcribed to myſelf at preſent. A diſtinct analyſis of his work might indeed be uſeful to many readers; but it would itſelf form a volume of conſiderable magnitude. I may perhaps, at ſome future period, preſent to the Society, an attempt towards ſuch an analyſis, which I began long ago, for my own ſatisfaction, and which I lately made conſiderable progreſs in preparing for the preſs, before I was aware of the impoſſibility of connecting it, with the general plan of this paper. In the mean time, I ſhall content myſelf with remarking, that the great and leading object of Mr. SMITH's ſpeculations is to illuſtrate the proviſion made by nature in the principles of the human mind, and in the circumſtances of man's external ſituation, for a gradual and progreſſive augmentation in the means of national wealth; and to demonſtrate, that the moſt effectual plan for advancing a people to greatneſs,

greatneſs, is to maintain that order of things which nature has pointed out; by allowing every man, as long as he obſerves the rules of juſtice, to purſue his own intereſt in his own way, and to bring both his induſtry and his capital into the freeſt competition with thoſe of his fellow-citizens. Every ſyſtem of policy which endeavours, either by extraordinary encouragements, to draw towards a particular ſpecies of induſtry a greater ſhare of the capital of the ſociety than what would naturally go to it; or, by extraordinary reſtraints, to force from a particular ſpecies of induſtry ſome ſhare of the capital which would otherwiſe be employed in it, is, in reality, ſubverſive of the great purpoſe which it means to promote.

What the circumſtances are, which, in modern Europe, have contributed to diſturb this order of nature, and, in particular, to encourage the induſtry of towns, at the expence of that of the country, Mr. SMITH has inveſtigated with great ingenuity; and in ſuch a manner, as to throw much new light on the hiſtory of that ſtate of ſociety which prevails in this quarter of the globe. His obſervations on this ſubject tend to ſhew, that theſe circumſtances were, in their firſt origin, the natural and the unavoidable reſult of the peculiar ſituation of mankind during a certain period; and that they took their riſe, not from any general ſcheme of policy, but from the private intereſts and prejudices of particular orders of men.

The ſtate of ſociety, however, which at firſt aroſe from a ſingular combination of accidents, has been prolonged much beyond its natural period, by a falſe ſyſtem of political œconomy, propagated by merchants and manufacturers; a claſs of individuals, whoſe intereſt is not always the ſame with that of the public, and whoſe profeſſional knowledge gave them many advantages, more particularly in the infancy

infancy of this branch of ſcience, in defending thoſe opinions which they wiſhed to encourage. By means of this ſyſtem, a new ſet of obſtacles to the progreſs of national proſperity has been created. Thoſe which aroſe from the diſorders of the feudal ages, tended directly to diſturb the internal arrangements of ſociety, by obſtructing the free circulation of labour and of ſtock, from employment to employment, and from place to place. The falſe ſyſtem of political œconomy which has been hitherto prevalent, as its profeſſed object has been to regulate the commercial intercourſe between different nations, has produced its effect in a way leſs direct and leſs manifeſt, but equally prejudicial to the ſtates that have adopted it.

On this ſyſtem, as it took its riſe from the prejudices, or rather from the intereſted views of mercantile ſpeculators, Mr. SMITH beſtows the title of the Commercial or Mercantile Syſtem; and he has conſidered at great length its two principal expedients for enriching a nation; reſtraints upon importation, and encouragements to exportation. Part of theſe expedients, he obſerves, have been dictated by the ſpirit of monopoly, and part by a ſpirit of jealouſy againſt thoſe countries with which the balance of trade is ſuppoſed to be diſadvantageous. All of them appear clearly, from his reaſonings, to have a tendency unfavourable to the wealth of the nation which impoſes them.—His remarks with reſpect to the jealouſy of commerce are expreſſed in a tone of indignation, which he ſeldom aſſumes in his political writings.

" In this manner (ſays he) the ſneaking arts of underling tradeſ-
" men are erected into political maxims for the conduct of a great
" empire. By ſuch maxims as theſe, nations have been taught that
" their intereſt conſiſted in beggaring all their neighbours. Each

" nation has been made to look with an invidious eye upon the " proſperity of all the nations with which it trades, and to conſider " their gain as its own loſs. Commerce, which ought naturally to be " among nations as among individuals, a bond of union and friend- " ſhip, has become the moſt fertile ſource of diſcord and animoſity. " The capricious ambition of Kings and Miniſters has not, during " the preſent and the preceding century, been more fatal to the re- " poſe of Europe, than the impertinent jealouſy of merchants and " manufacturers. The violence and injuſtice of the rulers of man- " kind is an ancient evil, for which perhaps the nature of human " affairs can ſcarce admit of a remedy. But the mean rapacity, the " monopolizing ſpirit of merchants and manufacturers, who neither " are nor ought to be the rulers of mankind, though it cannot per- " haps be corrected, may very eaſily be prevented from diſturbing " the tranquillity of any body but themſelves."

Such are the liberal principles which, according to *Mr.* SMITH, ought to direct the commercial policy of nations; and of which it ought to be the great object of legiſlators to facilitate the eſtabliſh- ment. In what manner the execution of the theory ſhould be con- ducted in particular inſtances, is a queſtion of a very different na- ture, and to which the anſwer muſt vary, in different countries, ac- cording to the different circumſtances of the caſe. In a ſpeculative work, ſuch as Mr. SMITH's, the conſideration of this queſtion did not fall properly under his general plan; but that he was abundantly aware of the danger to be apprehended from a raſh application of po- litical theories, appears not only from the general ſtrain of his writ- ings, but from ſome incidental obſervations which he has expreſsly made upon the ſubject. " So unfortunate (ſays he, in one paſſage) " are the effects of all the regulations of the mercantile ſyſtem, that " they

" they not only introduce very dangerous diſorders into the ſtate of " the body politic, but diſorders which it is often difficult to reme- " dy, without occaſioning, for a time at leaſt, ſtill greater diſor- " ders.—In what manner, therefore, the natural ſyſtem of perfect " liberty and juſtice ought gradually to be reſtored, we muſt leave to " the wiſdom of future ſtateſmen and legiſlators to determine." In the laſt edition of his Theory of Moral Sentiments, he has introduced ſome remarks, which have an obvious reference to the ſame important doctrine. The following paſſage ſeems to refer more particularly to thoſe derangements of the ſocial order which derived their origin from the feudal inſtitutions:

" The man whoſe public ſpirit is prompted altogether by huma- " nity and benevolence, will reſpect the eſtabliſhed powers and pri- " vileges even of individuals, and ſtill more of the great orders and " ſocieties into which the ſtate is divided. Though he ſhould con- " ſider ſome of them as in ſome meaſure abuſive, he will content " himſelf with moderating, what he often cannot annihilate with- " out great violence. When he cannot conquer the rooted preju- " dices of the people by reaſon and perſuaſion, he will not attempt " to ſubdue them by force; but will religiouſly obſerve what, by " CICERO, is juſtly called the divine maxim of PLATO, never to " uſe violence to his country no more than to his parents. He will " accommodate, as well as he can, his public arrangements to the " confirmed habits and prejudices of the people; and will remedy, " as well as he can, the inconveniencies which may flow from the " want of thoſe regulations which the people are averſe to ſubmit to. " When he cannot eſtabliſh the right, he will not diſdain to ame- " liorate the wrong; but like SOLON, when he cannot eſtabliſh

" the beſt ſyſtem of laws, he will endeavour to eſtabliſh the beſt " that the people can bear."

Theſe cautions with reſpect to the practical application of general principles were peculiarly neceſſary from the Author of " The " Wealth of Nations;" as the unlimited freedom of trade, which it is the chief aim of his work to recommend, is extremely apt, by flattering the indolence of the ſtateſman, to ſuggeſt to thoſe who are inveſted with abſolute power, the idea of carrying it into immediate execution. " Nothing is more adverſe to the tranquillity of " a ſtateſman (ſays the author of an Eloge on the Adminiſtration of " COLBERT) than a ſpirit of moderation; becauſe it condemns him " to perpetual obſervation, ſhews him every moment the inſufficiency of his wiſdom, and leaves him the melancholy ſenſe of his " own imperfection; while, under the ſhelter of a few general principles, a ſyſtematical politician enjoys a perpetual calm. By the " help of one alone, that of a perfect liberty of trade, he would " govern the world, and would leave human affairs to arrange themſelves at pleaſure, under the operation of the prejudices and the " ſelf-intereſt of individuals. If theſe run counter to each other, he " gives himſelf no anxiety about the conſequence; he inſiſts that " the reſult cannot be judged of till after a century or two ſhall have " elapſed. If his contemporaries, in conſequence of the diſorder " into which he has thrown public affairs, are ſcrupulous about ſubmitting quietly to the experiment, he accuſes them of impatience. " They alone, and not he, are to blame for what they have ſuffered; " and the principle continues to be inculcated with the ſame zeal and " the ſame confidence as before." Theſe are the words of the ingenious and eloquent author of the Eloge on COLBERT, which obtained

tained the prize from the French Academy in the year 1763; a performance which, although confined and erroneous in its ſpeculative views, abounds with juſt and important reflections of a practical nature. How far his remarks apply to that particular claſs of politicians whom he had evidently in his eye in the foregoing paſſage, I ſhall not preſume to decide.

It is hardly neceſſary for me to add to theſe obſervations, that they do not detract in the leaſt from the value of thoſe political theories which attempt to delineate the principles of a perfect legiſlation. Such theories (as I have elſewhere obſerved*) ought to be conſidered merely as deſcriptions of the *ultimate* objects at which the ſtateſman ought to aim. The tranquillity of his adminiſtration, and the immediate ſucceſs of his meaſures, depend on his good ſenſe and his practical ſkill; and his theoretical principles only enable him to direct his meaſures *ſteadily* and *wiſely*, to promote the improvement and happineſs of mankind, and prevent him from being ever led aſtray from theſe important ends, by more limited views of temporary expedience. "In all caſes (ſays Mr. HUME) it muſt be advantageous to know what is moſt perfect in the kind, that we may "be able to bring any real conſtitution or form of government as "near it as poſſible, by ſuch gentle alterations and innovations as "may not give too great diſturbance to ſociety."

The limits of this Memoir make it impoſſible for me to examine particularly the merit of Mr. SMITH's work in point of originality. That his doctrine concerning the freedom of trade and of induſtry coincides remarkably with that which we find in the writings of the French Oeconomiſts, appears from the ſlight view of their ſyſtem

* Elements of the Philoſophy of the Human Mind, p. 261.

which

which he himſelf has given. But it ſurely cannot be pretended by the warmeſt admirers of that ſyſtem, that any one of its numerous expoſitors has approached to Mr. SMITH in the preciſion and perſpicuity with which he has ſtated it, or in the ſcientific and luminous manner in which he has deduced it from elementary principles. The awkwardneſs of their technical language, and the paradoxical form in which they have choſen to preſent ſome of their opinions, are acknowledged even by thoſe who are moſt willing to do juſtice to their merits; whereas it may be doubted with reſpect to Mr. SMITH's Inquiry, if there exiſts any book beyond the circle of the mathematical and phyſical ſciences, which is at once ſo agreeable in its arrangement to the rules of a ſound logic, and ſo acceſſible to the examination of ordinary readers. Abſtracting entirely from the author's peculiar and original ſpeculations, I do not know, that upon any ſubject whatever, a work has been produced in our times, containing ſo methodical, ſo comprehenſive, and ſo judicious a digeſt of all the moſt profound and enlightened philoſophy of the age.

In juſtice alſo to Mr. SMITH, it muſt be obſerved, that although ſome of the œconomical writers had the ſtart of him in publiſhing their doctrines to the world, theſe doctrines appear, with reſpect to him, to have been altogether original, and the reſult of his own reflections. Of this, I think, every perſon muſt be convinced, who reads the Inquiry with due attention, and is at pains to examine the gradual and beautiful progreſs of the author's ideas: But in caſe any doubt ſhould remain on this head, it may be proper to mention, that Mr. SMITH's political lectures, comprehending the fundamental principles of his Inquiry, were delivered at Glaſgow as early as the year 1752 or 1753; at a period, ſurely, when there exiſted no French performance on the ſubject, that could be of much uſe to him

him in guiding his reſearches *. In the year 1756, indeed, M. TURGOT (who is ſaid to have imbibed his firſt notions concerning the unlimited freedom of commerce from an old merchant, M. GOURNAY) publiſhed in the *Encyclopedie*, an article which ſufficiently ſhews how completely his mind was emancipated from the old prejudices in favour of commercial regulations: But that even then, theſe opinions were confined to a few ſpeculative men in France, appears from a paſſage in the *Mémoires ſur la Vie et les Ouvrages de* M. TURGOT; in which, after a ſhort quotation from the article juſt mentioned, the author adds: "Theſe ideas were *then* conſidered as "paradoxical; they are ſince become common, and they will one "day be adopted univerſally."

The Political Diſcourſes of Mr. HUME were evidently of greater uſe to Mr. SMITH, than any other book that had appeared prior to his lectures. Even Mr. HUME's theories, however, though always plauſible and ingenious, and in moſt inſtances profound and juſt, involve ſome fundamental miſtakes; and, when compared with Mr. SMITH's, afford a ſtriking proof, that, in conſidering a ſubject ſo extenſive and ſo complicated, the moſt penetrating ſagacity, if directed only to particular queſtions, is apt to be led aſtray by firſt appearances; and that nothing can guard us effectually againſt error, but a comprehenſive ſurvey of the whole field of diſcuſſion, aſſiſted by an accurate and patient analyſis of the ideas about which our reaſonings are employed.—It may be worth while to add, that Mr. HUME's Eſſay "on the Jealouſy of Trade," with ſome other of his Political Diſcourſes, received a very flattering proof of M. TURGOT's

* In proof of this, it is ſufficient for me to appeal to a ſhort hiſtory of the progreſs of political œconomy in France, publiſhed in one of the volumes of *Ephemerides du Citoyen*. See the firſt part of the volume for the year 1769. The paper is entitled, *Notice abrégée des différens Ecrits modernes, qui ont concouru en France à former la ſcience de l'économie politique.*

appro-

approbation, by his undertaking the taſk of tranſlating them into the French language.

I am aware that the evidence I have hitherto produced of Mr. SMITH's originality may be objected to as not perfectly deciſive, as it reſts entirely on the recollection of thoſe ſtudents who attended his firſt courſes of moral philoſophy at Glaſgow; a recollection which, at the diſtance of forty years, cannot be ſuppoſed to be very accurate. There exiſts, however fortunately, a ſhort manuſcript drawn up by Mr. SMITH in the year 1755, and preſented by him to a ſociety of which he was then a member; in which paper, a pretty long enumeration is given of certain leading principles, both political and literary, to which he was anxious to eſtabliſh his excluſive right; in order to prevent the poſſibility of ſome rival claim which he thought he had reaſon to apprehend, and to which his ſituation as a Profeſſor, added to his unreſerved communications in private companies, rendered him peculiarly liable. This paper is at preſent in my poſſeſſion. It is expreſſed with a good deal of that honeſt and indignant warmth, which is perhaps unavoidable by a man who is conſcious of the purity of his own intentions, when he ſuſpects that advantages have been taken of the frankneſs of his temper. On ſuch occaſions, due allowances are not always made for thoſe plagiariſms which, however cruel in their effects, do not neceſſarily imply bad faith in thoſe who are guilty of them; for the bulk of mankind, incapable themſelves of original thought, are perfectly unable to form a conception of the nature of the injury done to a man of inventive genius, by encroaching on a favourite ſpeculation. For reaſons known to ſome members of this Society, it would be improper, by the publication of this manuſcript, to revive the memory of private differences; and I ſhould not have even al-

luded to it, if I did not think it a valuable document of the progreſs of Mr. SMITH's political ideas at a very early period. Many of the moſt important opinions in *The Wealth of Nations* are there detailed; but I ſhall quote only the following ſentences: "Man is generally "conſidered by ſtateſmen and projectors as the materials of a ſort of "political mechanics. Projectors diſturb nature in the courſe of "her operations in human affairs; and it requires no more than to "let her alone, and give her fair play in the purſuit of her ends, "that ſhe may eſtabliſh her own deſigns."—And in another paſſage: "Little elſe is requiſite to carry a ſtate to the higheſt degree of opu-"lence from the loweſt barbariſm, but peace, eaſy taxes, and a to-"lerable adminiſtration of juſtice; all the reſt being brought about "by the natural courſe of things. All governments which thwart "this natural courſe, which force things into another channel, or "which endeavour to arreſt the progreſs of ſociety at a particular "point, are unnatural, and to ſupport themſelves are obliged to be "oppreſſive and tyrannical.——A great part of the opinions (he ob-"ſerves) enumerated in this paper is treated of at length in ſome "lectures which I have ſtill by me, and which were written in the "hand of a clerk who left my ſervice ſix years ago. They have all "of them been the conſtant ſubjects of my lectures ſince I firſt "taught Mr. CRAIGIE's claſs, the firſt winter I ſpent in Glaſgow, "down to this day, without any conſiderable variation. They had "all of them been the ſubjects of lectures which I read at Edin-"burgh the winter before I left it, and I can adduce innumerable "witneſſes, both from that place and from this, who will aſcertain "them ſufficiently to be mine."

After all, perhaps the merit of ſuch a work as Mr. SMITH's is to be eſtimated leſs from the novelty of the principles it contains, than from

the reaſonings employed to ſupport theſe principles, and from the ſcientific manner in which they are unfolded in their proper order and connection. General aſſertions with reſpect to the advantages of a free commerce, may be collected from various writers of an early date. But in queſtions of ſo complicated a nature as occur in political œconomy, the credit of ſuch opinions belongs of right to the author who firſt eſtabliſhed their ſolidity, and followed them out to their remote conſequences; not to him who, by a fortunate accident, firſt ſtumbled on the truth.

Beſides the principles which Mr. SMITH conſidered as more peculiarly his own, his Inquiry exhibits a ſyſtematical view of the moſt important articles of political œconomy, ſo as to ſerve the purpoſe of an elementary treatiſe on that very extenſive and difficult ſcience. The ſkill and the comprehenſiveneſs of mind diſplayed in his arrangement, can be judged of by thoſe alone who have compared it with that adopted by his immediate predeceſſors. And perhaps, in point of utility, the labour he has employed in connecting and methodiſing their ſcattered ideas, is not leſs valuable than the reſults of his own original ſpeculations: For it is only when digeſted in a clear and natural order, that truths make their proper impreſſion on the mind, and that erroneous opinions can be combated with ſucceſs.

It does not belong to my preſent undertaking (even if I were qualified for ſuch a taſk) to attempt the ſeparation of the ſolid and important doctrines of Mr. SMITH's book from thoſe opinions which appear exceptionable or doubtful. I acknowledge, that there are ſome of his concluſions to which I would not be underſtood to ſubſcribe implicitly; more particularly in that chapter, where he treats of the principles of taxation, and which is certainly executed in

in a manner more looſe and unſatisfactory than the other parts of his ſyſtem.

It would be improper for me to conclude this ſection without taking notice of the manly and dignified freedom with which the author uniformly delivers his opinions, and of the ſuperiority which he diſcovers throughout, to all the little paſſions connected with the factions of the times in which he wrote. Whoever takes the trouble to compare the general tone of his compoſition with the period of its firſt publication, cannot fail to feel and acknowledge the force of this remark.——It is not often that a diſintereſted zeal for truth has ſo ſoon met with its juſt reward. Philoſophers (to uſe an expreſſion of Lord BACON's) are "the ſervants of poſterity;" and moſt of thoſe who have devoted their talents to the beſt intereſts of mankind, have been obliged, like BACON, to "bequeath their fame" to a race yet unborn, and to conſole themſelves with the idea of ſowing what another generation was to reap:

Inſere Daphni pyros, carpent tua poma nepotes.

Mr. SMITH was more fortunate; or rather, in this reſpect, his fortune was ſingular. He ſurvived the publication of his work only fifteen years; and yet, during that ſhort period, he had not only the ſatisfaction of ſeeing the oppoſition it at firſt excited, gradually ſubſide, but to witneſs the practical influence of his writings on the commercial policy of his country.

SECTION V.

Concluſion of the Narrative.

ABOUT two years after the publication of "The Wealth of Nations," Mr. SMITH was appointed one of the Commiſſioners of his Majeſty's Cuſtoms in Scotland; a preferment which, in his eſtimation, derived an additional value from its being beſtowed on him at the requeſt of the Duke of BUCCLEUGH. The greater part of theſe two years he paſſed at London, in a ſociety too extenſive and varied to afford him any opportunity of indulging his taſte for ſtudy. His time, however, was not loſt to himſelf; for much of it was ſpent with ſome of the firſt names in Engliſh literature. Of theſe no unfavourable ſpecimen is preſerved by Dr. BARNARD, in his well known "Verſes addreſſed to Sir JOSHUA REYNOLDS "and his friends."

If I have thoughts, and can't expreſs 'em,
GIBBON ſhall teach me how to dreſs 'em
In words ſelect and terſe:
JONES teach me modeſty and Greek,
SMITH how to think, BURKE how to ſpeak,
And BEAUCLERC to converſe *.

In conſequence of Mr. SMITH's appointment to the Board of Cuſtoms, he removed, in 1778, to Edinburgh, where he ſpent the

* See Annual Regiſter for the year 1776.

laſt

laſt twelve years of his life; enjoying an affluence which was more than equal to all his wants; and, what was to him of ſtill greater value, the proſpect of paſſing the remainder of his days among the companions of his youth.

His mother, who, though now in extreme old age, ſtill poſſeſſed a conſiderable degree of health, and retained all her faculties unimpaired, accompanied him to town; and his couſin Miſs JANE DOUGLAS, (who had formerly been a member of his family at Glaſgow, and for whom he had always felt the affection of a brother,) while ſhe divided with him thoſe tender attentions which her aunt's infirmities required, relieved him of a charge for which he was peculiarly ill qualified, by her friendly ſuperintendance of his domeſtic œconomy.

The acceſſion to his income which his new office brought him, enabled him to gratify, to a much greater extent than his former circumſtances admitted of, the natural generoſity of his diſpoſition; and the ſtate of his funds at the time of his death, compared with his very moderate eſtabliſhment, confirmed, beyond a doubt, what his intimate acquaintances had often ſuſpected, that a large proportion of his annual ſavings was allotted to offices of ſecret charity. A ſmall, but excellent library, which he had gradually formed with great judgment in the ſelection; and a ſimple, though hoſpitable table, where, without the formality of an invitation, he was always happy to receive his friends, were the only expences that could be conſidered as his own *.

The

* Some very affecting inſtances of Mr. SMITH's beneficence, in caſes where he found it impoſſible to conceal entirely his good offices, have been mentioned to me by a near relation of his, and one of his moſt confidential friends, Miſs Ross, daughter

The change in his habits which his removal to Edinburgh produced, was not equally favourable to his literary purſuits. The duties of his office, though they required but little exertion of thought, were yet ſufficient to waſte his ſpirits and to diſſipate his attention; and now that his career is cloſed, it is impoſſible to reflect on the time they conſumed, without lamenting, that it had not been employed in labours more profitable to the world, and more equal to his mind.

During the firſt years of his reſidence in this city, his ſtudies ſeemed to be entirely ſuſpended; and his paſſion for letters ſerved only to amuſe his leiſure, and to animate his converſation. The infirmities of age, of which he very early began to feel the approaches, reminded him at laſt, when it was too late, of what he yet owed to the public, and to his own fame. The principal materials of the works which he had announced, had been long ago collected; and little probably was wanting, but a few years of health and retirement, to beſtow on them that ſyſtematical arrangement in which he delighted; and the ornaments of that flowing, and apparently artleſs ſtyle, which he had ſtudiouſly cultivated, but which, after all his experience in compoſition, he adjuſted, with extreme difficulty, to his own taſte *.

The

ter of the late PATRICK ROSS, Eſq. of Innernethy. They were all on a ſcale much beyond what might have been expected from his fortune; and were accompanied with circumſtances equally honourable to the delicacy of his feelings and the liberality of his heart.

* Mr. SMITH obſerved to me, not long before his death, that after all his practice in writing, he compoſed as ſlowly, and with as great difficulty, as at firſt. He added, at the ſame time, that Mr. HUME had acquired ſo great a facility in this reſpect, that

The death of his mother in 1784, which was followed by that of Miſs DOUGLAS in 1788, contributed, it is probable, to fruſtrate theſe projects. They had been the objects of his affection for more than ſixty years; and in their ſociety he had enjoyed, from his infancy, all that he ever knew of the endearments of a family. He was now alone, and helpleſs; and, though he bore his loſs with equanimity, and regained apparently his former cheerfulneſs, yet his health and ſtrength gradually declined till the period of his death, which happened in July 1790, about two years after that of his couſin, and ſix after that of his mother. His laſt illneſs, which aroſe from a chronic obſtruction in his bowels, was lingering and painful; but had every conſolation to ſooth it which he could derive from the tendereſt ſympathy of his friends, and from the complete reſignation of his own mind

A few days before his death, finding his end approach rapidly, he gave orders to deſtroy all his manuſcripts, excepting ſome detached eſſays, which he entruſted to the care of his executors; and they were accordingly committed to the flames. What were the particular contents of theſe papers, is not known even to his moſt intimate friends; but there can be no doubt that they conſiſted, in part, of the lectures on rhetoric, which he read at Edinburgh in the year 1748, and of the lectures on natural religion and on juriſprudence, which formed part of his courſe at Glaſgow. That this irreparable

that the laſt volumes of his Hiſtory were printed from his original copy, with a few marginal corrections.

It may gratify the curioſity of ſome readers to know, that when Mr. SMITH was employed in compoſition, he generally walked up and down his apartment, dictating to a ſecretary. All Mr. HUME's works (I have been aſſured) were written with his own hand. A critical reader may, I think, perceive in the different ſtyles of theſe two claſſical writers, the effects of their different modes of ſtudy.

injury to letters proceeded, in ſome degree, from an exceſſive ſolicitude in the author about his poſthumous reputation, may perhaps be true; but with reſpect to ſome of his manuſcripts, may we not ſuppoſe, that he was influenced by higher motives? It is but ſeldom that a philoſopher, who has been occupied from his youth with moral or with political enquiries, ſucceeds completely to his wiſh in ſtating to others, the grounds upon which his own opinions are founded; and hence it is, that the known principles of an individual, who has approved to the public his candour, his liberality, and his judgment, are entitled to a weight and an authority, independent of the evidence which he is able, upon any particular occaſion, to produce in their ſupport. A ſecret conſciouſneſs of this circumſtance, and an apprehenſion, that by not doing juſtice to an important argument, the progreſs of truth may be rather retarded than advanced, have probably induced many authors to with-hold from the world the unfiniſhed reſults of their moſt valuable labours; and to content themſelves with giving the general ſanction of their ſuffrages to truths which they regarded as peculiarly intereſting to the human race *.

The

Since writing the above, I have been favoured by Dr. HUTTON with the following particulars.

"Some time before his laſt illneſs, when Mr. SMITH had occaſion to go to London, he enjoined his friends, to whom he had entruſted the diſpoſal of his manuſcripts, that in the event of his death, they ſhould deſtroy all the volumes of his lectures, doing with the reſt of his manuſcripts what they pleaſed. When now he had become weak, and ſaw the approaching period of his life, he ſpoke to his friends again upon the ſame ſubject. They entreated him to make his mind eaſy, as he might depend upon their fulfilling his deſire. He was then ſatisfied. But ſome days afterwards, finding his anxiety not entirely removed, he begged one of them to deſtroy the volumes immediately. This accordingly was done; and his mind was ſo much relieved, that he was able to receive his friends in the evening with his uſual complacency

"They

The additions to the Theory of Moral Sentiments, moſt of which were compoſed under ſevere diſeaſe, had fortunately been ſent to the preſs in the beginning of the preceding winter; and the author lived to ſee the publication of the work. The moral and ſerious ſtrain that prevails through theſe additions, when connected with the circumſtance of his declining health, adds a peculiar charm to his pathetic eloquence, and communicates a new intereſt, if poſſible,

"They had been in uſe to ſup with him every Sunday; and that evening there was a pretty numerous meeting of them. Mr. SMITH not finding himſelf able to ſit up with them as uſual, retired to bed before ſupper; and, as he went away, took leave of his friends by ſaying, 'I believe we muſt adjourn this meeting to ſome other place.' He died a very few days afterwards."

Mr. RIDDELL, an intimate friend of MR. SMITH'S, who was preſent at one of the converſations on the ſubject of the manuſcripts, mentioned to me, in addition to Dr. HUTTON'S note, that Mr. SMITH regretted, "he had done ſo little." "But I meant (ſaid he) to have done more; and there are materials in my papers, of which I could have made a great deal. But that is now out of the queſtion."

That the idea of deſtroying ſuch unfiniſhed works as might be in his poſſeſſion at the time of his death, was not the effect of any ſudden or haſty reſolution, appears from the following letter to Mr. HUME, written by Mr. SMITH in 1773, at a time when he was preparing himſelf for a journey to London, with the proſpect of a pretty long abſence from Scotland.

MY DEAR FRIEND, *Edinburgh, 16th April* 1773.

As I have left the care of all my literary papers to you, I muſt tell you, that except thoſe which I carry along with me, there are none worth the publication, but a fragment of a great work, which contains a hiſtory of the aſtronomical ſyſtems that were ſucceſſively in faſhion down to the time of DES CARTES. Whether that might not be publiſhed as a fragment of an intended juvenile work, I leave entirely to your judgment, though I begin to ſuſpect myſelf that there is more refinement than ſolidity in ſome parts of it. This little work you will find in a thin folio paper book in my back room. All the other looſe papers which you will find in that deſk, or within the glaſs folding doors of a bureau which ſtands in my bed-room, together with about eighteen thin paper folio books, which you will likewiſe find within the ſame glaſs folding doors, I deſire may be deſtroyed without any examination. Unleſs I die very ſuddenly, I ſhall take care that the papers I carry with me ſhall be carefully ſent to you.

I ever am, my dear Friend, moſt faithfully your's,

ADAM SMITH.

To DAVID HUME, Eſq.
St. Andrew's Square.

to thoſe ſublime truths, which, in the academical retirement of his youth, awakened the firſt ardours of his genius, and on which the laſt efforts of his mind repoſed.

In a letter addreſſed, in the year 1787, to the Principal of the Univerſity of Glaſgow, in conſequence of being elected Rector of that learned body, a pleaſing memorial remains of the ſatisfaction with which he always recollected that period of his literary career, which had been more peculiarly conſecrated to theſe important ſtudies. "No preferment (ſays he) could have given me ſo much real "ſatisfaction. No man can owe greater obligations to a ſociety "than I do to the Univerſity of Glaſgow. They educated me; "they ſent me to Oxford. Soon after my return to Scotland, they "elected me one of their own members; and afterwards preferred me "to another office, to which the abilities and virtues of the never "to be forgotten Dr. HUTCHESON had given a ſuperior degree of "illuſtration. The period of thirteen years which I ſpent as a "member of that ſociety, I remember as by far the moſt uſeful, "and therefore as by far the happieſt and moſt honourable pe-"riod of my life; and now, after three and twenty years abſence, "to be remembered in ſo very agreeable a manner by my old "friends and protectors, gives me a heart-felt joy which I can-"not eaſily expreſs to you."

THE ſhort narrative which I have now finiſhed, however barren of incident, may convey a general idea of the genius and character of this illuſtrious Man. Of the intellectual gifts and attainments by which he was ſo eminently diſtinguiſhed;—of the originality and comprehenſiveneſs of his views; the extent, the variety, and the correctneſs of his information; the inexhauſtible fertility of his invention;

vention; and the ornaments which his rich and beautiful imagination had borrowed from claſſical culture;---he has left behind him laſting monuments. To his private worth the moſt certain of all teſtimonies may be found in that confidence, reſpect, and attachment, which followed him through all the various relations of life. The ſerenity and gaiety he enjoyed, under the preſſure of his growing infirmities, and the warm intereſt he felt to the laſt, in every thing connected with the welfare of his friends, will be long remembered by a ſmall circle, with whom, as long as his ſtrength permitted, he regularly ſpent an evening in the week; and to whom the recollection of his worth ſtill forms a pleaſing, though melancholy bond of union.

The more delicate and characteriſtical features of his mind, it is perhaps impoſſible to trace. That there were many peculiarities, both in his manners, and in his intellectual habits, was manifeſt to the moſt ſuperficial obſervor; but although, to thoſe who knew him, theſe peculiarities detracted nothing from the reſpect which his abilities commanded; and although, to his intimate friends, they added an inexpreſſible charm to his converſation, while they diſplayed, in the moſt intereſting light, the artleſs ſimplicity of his heart; yet it would require a very ſkilful pencil to preſent them to the public eye. He was certainly not fitted for the general commerce of the world, or for the buſineſs of active life. The comprehenſive ſpeculations with which he had been occupied from his youth, and the variety of materials which his own invention continually ſupplied to his thoughts, rendered him habitually inattentive to familiar objects, and to common occurrences; and he frequently exhibited inſtances of abſence, which have ſcarcely been ſurpaſſed by the fancy of La BRUYERE. Even in company, he was apt to

be ingroſſed with his ſtudies; and appeared, at times, by the motion of his lips, as well as by his looks and geſtures, to be in the fervour of compoſition. I have often, however, been ſtruck, at the diſtance of years, with his accurate memory of the moſt trifling particulars; and am inclined to believe, from this and ſome other circumſtances, that he poſſeſſed a power, not perhaps uncommon among abſent men, of recollecting, in conſequence of ſubſequent efforts of reflection, many occurrences which, at the time when they happened, did not ſeem to have ſenſibly attracted his notice.

To the defect now mentioned, it was probably owing, in part, that he did not fall in eaſily with the common dialogue of converſation, and that he was ſomewhat apt to convey his own ideas in the form of a lecture. When he did ſo, however, it never proceeded from a wiſh to ingroſs the diſcourſe, or to gratify his vanity. His own inclination diſpoſed him ſo ſtrongly to enjoy in ſilence the gaiety of thoſe around him, that his friends were often led to concert little ſchemes, in order to bring him on the ſubjects moſt likely to intereſt him. Nor do I think I ſhall be accuſed of going too far, when I ſay, that he was ſcarcely ever known to ſtart a new topic himſelf, or to appear unprepared upon thoſe topics that were introduced by others. Indeed, his converſation was never more amuſing than when he gave a looſe to his genius, upon the very few branches of knowledge of which he only poſſeſſed the outlines.

The opinions he formed of men, upon a ſlight acquaintance, were frequently erroneous; but the tendency of his nature inclined him much more to blind partiality, than to ill-founded prejudice. The enlarged views of human affairs, on which his mind habitually dwelt, left him neither time nor inclination to ſtudy, in detail, the

the unintereſting peculiarities of ordinary characters; and accordingly, though intimately acquainted with the capacities of the intellect, and the workings of the heart, and accuſtomed, in his theories, to mark, with the moſt delicate hand, the niceſt ſhades, both of genius and of the paſſions; yet, in judging of individuals, it ſometimes happened, that his eſtimates were, in a ſurpriſing degree, wide of the truth.

The opinions, too, which, in the thoughtleſſneſs and confidence of his ſocial hours, he was accuſtomed to hazard on books, and on queſtions of ſpeculation, were not uniformly ſuch as might have been expected from the ſuperiority of his underſtanding, and the ſingular conſiſtency of his philoſophical principles. They were liable to be influenced by accidental circumſtances, and by the humour of the moment; and when retailed by thoſe who only ſaw him occaſionally, ſuggeſted falſe and contradictory ideas of his real ſentiments. On theſe, however, as on moſt other occaſions, there was always much truth, as well as ingenuity, in his remarks; and if the different opinions which, at different times, he pronounced upon the ſame ſubject, had been all combined together, ſo as to modify and limit each other, they would probably have afforded materials for a deciſion, equally comprehenſive and juſt. But, in the ſociety of his friends, he had no diſpoſition to form thoſe qualified concluſions that we admire in his writings; and he generally contented himſelf with a bold and maſterly ſketch of the object, from the firſt point of view in which his temper, or his fancy, preſented it. Something of the ſame kind might be remarked, when he attempted, in the flow of his ſpirits, to delineate thoſe characters which, from long intimacy, he might have been ſuppoſed to underſtand thoroughly. The picture was always lively, and expreſ-

ſive;

ſive; and commonly bore a ſtrong and amuſing reſemblance to the original, when viewed under one particular aſpect; but ſeldom, perhaps, conveyed a juſt and complete conception of it in all its dimenſions and proportions.—In a word, it was the fault of his unpremeditated judgments, to be too ſyſtematical, and too much in extremes.

But, in whatever way theſe trifling peculiarities in his manners may be explained, there can be no doubt, that they were intimately connected with the genuine artleſſneſs of his mind. In this amiable quality, he often recalled to his friends, the accounts that are given of good LA FONTAINE; a quality which in him derived a peculiar grace from the ſingularity of its combination with thoſe powers of reaſon and of eloquence which, in his political and moral writings, have long engaged the admiration of Europe.

In his external form and appearance, there was nothing uncommon. When perfectly at eaſe, and when warmed with converſation, his geſtures were animated, and not ungraceful; and, in the ſociety of thoſe he loved, his features were often brightened with a ſmile of inexpreſſible benignity. In the company of ſtrangers, his tendency to abſence, and perhaps ſtill more his conſciouſneſs of this tendency, rendered his manner ſomewhat embarraſſed;—an effect which was probably not a little heightened by thoſe ſpeculative ideas of propriety, which his recluſe habits tended at once to perfect in his conception, and to diminiſh his power of realizing. He never ſat for his picture; but the medallion of TASSIE conveys an exact idea of his profile, and of the general expreſſion of his countenance.

The

The valuable library that he had collected he bequeathed, together with the reſt of his property, to his couſin Mr. DAVID DOUGLAS, Advocate. In the education of this young gentleman, he had employed much of his leiſure; and it was only two years before his death, (at a time when he could ill ſpare the pleaſure of his ſociety,) that he had ſent him to ſtudy law at Glaſgow, under the care of Mr. MILLAR;—the ſtrongeſt proof he could give of his diſintereſted zeal for the improvement of his friend, as well as of the eſteem in which he held the abilities of that eminent Profeſſor.

The executors of his will were Dr. BLACK and Dr. HUTTON; with whom he had long lived in habits of the moſt intimate and cordial friendſhip; and who, to the many other teſtimonies which they had given him of their affection, added the mournful office of witneſſing his laſt moments.

THE

THE

PRINCIPLES

WHICH LEAD AND DIRECT

PHILOSOPHICAL ENQUIRIES;

ILLUSTRATED BY THE

HISTORY of ASTRONOMY.

53340

THE

HISTORY

OF

ASTRONOMY.

WONDER, Surpriſe, and Admiration, are words which, though often confounded, denote, in our language, ſentiments that are indeed allied, but that are in ſome reſpects different alſo, and diſtinct from one another. What is new and ſingular, excites that ſentiment which, in ſtrict propriety, is called Wonder; what is unexpected, Surpriſe; and what is great or beautiful, Admiration.

We wonder at all extraordinary and uncommon objects, at all the rarer phænomena of nature, at meteors, comets, eclipſes, at ſingular plants and animals, and at every thing, in ſhort, with which we have before been either little or not at all acquainted; and we ſtill wonder, though forewarned of what we are to ſee.

We are ſurpriſed at thoſe things which we have ſeen often, but which we leaſt of all expected to meet with in the place where we find them; we are ſurpriſed at the ſudden appearance of a friend, whom we have ſeen a thouſand times, but whom we did not imagine we were to ſee then.

We admire the beauty of a plain or the greatneſs of a mountain, though we have ſeen both often before, and though nothing appears to us in either, but what we had expected with certainty to ſee.

Whether this criticiſm upon the preciſe meaning of theſe words be juſt, is of little importance. I imagine it is juſt, though I acknowledge, that the beſt writers in our language have not always made uſe of them according to it. Milton, upon the appearance of Death to Satan, ſays, that

> The Fiend what this might be admir'd;
> Admir'd, not fear'd.———

But if this criticiſm be juſt, the proper expreſſion ſhould have been *wonder'd*.—Dryden, upon the diſcovery of Iphigenia ſleeping, ſays, that

> The fool of nature ſtood with ſtupid eyes
> And gaping mouth, that teſtified ſurpriſe.

But what Cimon muſt have felt upon this occaſion could not ſo much be Surpriſe, as Wonder and Admiration. All that I contend for is, that the ſentiments excited by what is new, by what is unexpected, and by what is great and beautiful, are really different, however the words made uſe of to expreſs them may ſometimes be confounded. Even the admiration which is excited by beauty, is quite different (as will appear more fully hereafter) from that which is inſpired by greatneſs, though we have but one word to denote them.

Theſe ſentiments, like all others when inſpired by one and the ſame object, mutually ſupport and enliven one another: an object with which we are quite familiar, and which we ſee every day, produces, though both great and beautiful, but a ſmall effect upon us; becauſe our admiration is not ſupported either by Wonder or by Surpriſe: and if we have heard a very accurate deſcription of a monſter,

monſter, our Wonder will be the leſs when we ſee it; becauſe our previous knowledge of it will in a great meaſure prevent our Surpriſe.

It is the deſign of this Eſſay to conſider particularly the nature and cauſes of each of theſe ſentiments, whoſe influence is of far wider extent than we ſhould be apt upon a careleſs view to imagine. I ſhall begin with Surpriſe.

SECTION I.

Of the Effect of Unexpectedneſs, or of Surpriſe.

WHEN an object of any kind, which has been for ſome time expected and foreſeen, preſents itſelf, whatever be the emotion which it is by nature fitted to excite, the mind muſt have been prepared for it, and muſt even in ſome meaſure have conceived it before-hand; becauſe the idea of the object having been ſo long preſent to it, muſt have before-hand excited ſome degree of the ſame emotion which the object itſelf would excite: the change, therefore, which its preſence produces comes thus to be leſs conſiderable, and the emotion or paſſion which it excites glides gradually and eaſily into the heart, without violence, pain, or difficulty.

But the contrary of all this happens when the object is unexpected; the paſſion is then poured in all at once upon the heart, which is thrown, if it is a ſtrong paſſion, into the moſt violent and convulſive emotions, ſuch as ſometimes cauſe immediate death; ſometimes, by the ſuddenneſs of the extacy, ſo entirely disjoint the whole frame of the imagination, that it never after returns to its former tone and compoſure, but falls either into a frenzy or habitual lunacy; and ſuch as almoſt always occaſion a momentary loſs of reaſon, or of that

that attention to other things which our ſituation or our duty requires.

How much we dread the effects of the more violent paſſions, when they come ſuddenly upon the mind, appears from thoſe preparations which all men think neceſſary when going to inform any one of what is capable of exciting them. Who would chooſe all at once to inform his friend of an extraordinary calamity that had befallen him, without taking care before-hand, by alarming him with an uncertain fear, to announce, if one may ſay ſo, his misfortune, and thereby prepare and diſpoſe him for receiving the tidings?

Thoſe panic terrors which ſometimes ſeize armies in the field, or great cities, when an enemy is in the neighbourhood, and which deprive for a time the moſt determined of all deliberate judgments, are never excited but by the ſudden apprehenſion of unexpected danger. Such violent conſternations, which at once confound whole multitudes, benumb their underſtandings, and agitate their hearts, with all the agony of extravagant fear, can never be produced by any foreſeen danger, how great ſoever. Fear, though naturally a very ſtrong paſſion, never riſes to ſuch exceſſes, unleſs exaſperated both by Wonder, from the uncertain nature of the danger, and by Surpriſe, from the ſuddenneſs of the apprehenſion.

Surpriſe, therefore, is not to be regarded as an original emotion of a ſpecies diſtinct from all others. The violent and ſudden change produced upon the mind, when an emotion of any kind is brought ſuddenly upon it, conſtitutes the whole nature of Surpriſe.

But when not only a paſſion and a great paſſion comes all at once upon the mind, but when it comes upon it while the mind is in the mood moſt unfit for conceiving it, the Surpriſe is then the greateſt.

greateſt. Surpriſes of joy when the mind is ſunk into grief, or of grief when it is elated with joy, are therefore the moſt unſupportable. The change is in this caſe the greateſt poſſible. Not only a ſtrong paſſion is conceived all at once, but a ſtrong paſſion the direct oppoſite of that which was before in poſſeſſion of the ſoul. When a load of ſorrow comes down upon the heart that is expanded and elated with gaiety and joy, it ſeems not only to damp and oppreſs it, but almoſt to cruſh and bruiſe it, as a real weight would cruſh and bruiſe the body. On the contrary, when from an unexpected change of fortune, a tide of gladneſs ſeems, if I may ſay ſo, to ſpring up all at once within it, when depreſſed and contracted with grief and ſorrow, it feels as if ſuddenly extended and heaved up with violent and irreſiſtible force, and is torn with pangs of all others moſt exquiſite, and which almoſt always occaſion faintings, deliriums, and ſometimes inſtant death. For it may be worth while to obſerve, that though grief be a more violent paſſion than joy, as indeed all uneaſy ſenſations ſeem naturally more pungent than the oppoſite agreeable ones, yet of the two, Surpriſes of joy are ſtill more inſupportable than Surpriſes of grief. We are told that after the battle of Thraſimenus, while a Roman lady, who had been informed that her ſon was ſlain in the action, was ſitting alone bemoaning her misfortunes, the young man who eſcaped came ſuddenly into the room to her, and that ſhe cried out and expired inſtantly in a tranſport of joy. Let us ſuppoſe the contrary of this to have happened, and that in the midſt of domeſtic feſtivity and mirth, he had ſuddenly fallen down dead at her feet, is it likely that the effects would have been equally violent? I imagine not. The heart ſprings to joy with a ſort of natural elaſticity, it abandons itſelf to ſo agreeable an emotion, as ſoon as the object is preſented; it ſeems to pant and leap forward to meet it, and the paſſion in its full force takes at once entire and complete poſſeſſion of the ſoul. But it is otherways with grief; the heart recoils from, and reſiſts the firſt

approaches of that diſagreeable paſſion, and it requires ſome time before the melancholy object can produce its full effect. Grief comes on ſlowly and gradually, nor ever riſes at once to that height of agony to which it is increaſed after a little time. But joy comes ruſhing upon us all at once like a torrent. The change produced therefore by a Surpriſe of joy is more ſudden, and upon that account more violent and apt to have more fatal effects, than that which is occaſioned by a Surpriſe of grief; there ſeems too to be ſomething in the nature of Surpriſe, which makes it unite more eaſily with the briſk and quick motion of joy, than with the ſlower and heavier movement of grief. Moſt men who can take the trouble to recollect, will find that they have heard of more people who died or became diſtracted with ſudden joy, than with ſudden grief. Yet from the nature of human affairs, the latter muſt be much more frequent than the former. A man may break his leg, or loſe his ſon, though he has had no warning of either of theſe events, but he can hardly meet with an extraordinary piece of good fortune, without having had ſome foreſight of what was to happen.

Not only grief and joy but all the other paſſions, are more violent, when oppoſite extremes ſucceed each other. Is any reſentment ſo keen as what follows the quarrels of lovers, or any love ſo paſſionate as what attends their reconcilement?

Even the objects of the external ſenſes affect us in a more lively manner, when oppoſite extremes ſucceed to, or are placed beſide each other. Moderate warmth ſeems intolerable heat if felt after extreme cold. What is bitter will ſeem more ſo when taſted after what is very ſweet; a dirty white will ſeem bright and pure when placed by a jet black. The vivacity in ſhort of every ſenſation, as well as of every ſentiment, ſeems to be greater or leſs in proportion to the change made by the impreſſion of either upon the ſituation

ſituation of the mind or organ; but this change muſt neceſſarily be the greateſt when oppoſite ſentiments and ſenſations are contraſted, or ſucceed immediately to one another. Both ſentiments and ſenſations are then the livelieſt; and this ſuperior vivacity proceeds from nothing but their being brought upon the mind or organ when in a ſtate moſt unfit for conceiving them.

As the oppoſition of contraſted ſentiments heightens their vivacity, ſo the reſemblance of thoſe which immediately ſucceed each other renders them more faint and languid. A parent who has loſt ſeveral children immediately after one another, will be leſs affected with the death of the laſt than with that of the firſt, though the loſs in itſelf be, in this caſe, undoubtedly greater; but his mind being already ſunk into ſorrow, the new misfortune ſeems to produce no other effect than a continuance of the ſame melancholy, and is by no means apt to occaſion ſuch tranſports of grief as are ordinarily excited by the firſt calamity of the kind; he receives it, though with great dejection, yet with ſome degree of calmneſs and compoſure, and without any thing of that anguiſh and agitation of mind which the novelty of the misfortune is apt to occaſion. Thoſe who have been unfortunate through the whole courſe of their lives are often indeed habitually melancholy, and ſometimes peeviſh and ſplenetic, yet upon any freſh diſappointment, though they are vexed and complain a little, they ſeldom fly out into any more violent paſſion, and never fall into thoſe tranſports of rage or grief which often, upon the like occaſions, diſtract the fortunate and ſucceſsful.

Upon this are founded, in a great meaſure, ſome of the effects of habit and cuſtom. It is well known that cuſtom deadens the vivacity of both pain and pleaſure, abates the grief we ſhould feel for the one, and weakens the joy we ſhould derive from the other. The pain is ſupported without agony, and the pleaſure enjoyed without

rapture: becauſe cuſtom and the frequent repetition of any object comes at laſt to form and bend the mind or organ to that habitual mood and diſpoſition which fits them to receive its impreſſion, without undergoing any very violent change.

SECTION II.

Of Wonder, or of the Effects of Novelty.

IT is evident that the mind takes pleaſure in obſerving the reſemblances that are diſcoverable betwixt different objects. It is by means of ſuch obſervations that it endeavours to arrange and methodiſe all its ideas, and to reduce them into proper claſſes and aſſortments. Where it can obſerve but one ſingle quality, that is common to a great variety of otherwiſe widely different objects, that ſingle circumſtance will be ſufficient for it to connect them all together, to reduce them to one common claſs, and to call them by one general name. It is thus that all things endowed with a power of ſelf-motion, beaſts, birds, fiſhes, inſects, are claſſed under the general name of Animal; and that theſe again, along with thoſe which want that power, are arranged under the ſtill more general word Subſtance: and this is the origin of thoſe aſſortments of objects and ideas which in the ſchools are called Genera and Species, and of thoſe abſtract and general names, which in all languages are made uſe of to expreſs them.

The further we advance in knowledge and experience, the greater number of diviſions and ſubdiviſions of thoſe Genera and Species we are both inclined and obliged to make. We obſerve a greater variety of particularities amongſt thoſe things which have a groſs reſemblance; and having made new diviſions of them, according to thoſe

thoſe newly-obſerved particularities, we are then no longer to be ſatisfied with being able to refer an object to a remote genus, or very general claſs of things, to many of which it has but a looſe and imperfect reſemblance. A perſon, indeed, unacquainted with botany may expect to ſatisfy your curioſity, by telling you, that ſuch a vegetable is a weed, or, perhaps in ſtill more general terms, that it is a plant. But a botaniſt will neither give nor accept of ſuch an anſwer. He has broke and divided that great claſs of objects into a number of inferior aſſortments, according to thoſe varieties which his experience has diſcovered among them; and he wants to refer each individual plant to ſome tribe of vegetables, with all of which it may have a more exact reſemblance, than with many things comprehended under the extenſive genus of plants. A child imagines that it gives a ſatisfactory anſwer when it tells you, that an object whoſe name it knows not is a thing, and fancies that it informs you of ſomething, when it thus aſcertains to which of the two moſt obvious and comprehenſive claſſes of objects a particular impreſſion ought to be referred; to the claſs of realities or ſolid ſubſtances which it calls *things*, or to that of appearances which it calls *nothings*.

Whatever, in ſhort, occurs to us we are fond of referring to ſome ſpecies or claſs of things, with all of which it has a nearly exact reſemblance; and though we often know no more about them than about it, yet we are apt to fancy that by being able to do ſo, we ſhow ourſelves to be better acquainted with it, and to have a more thorough inſight into its nature. But when ſomething quite new and ſingular is preſented, we feel ourſelves incapable of doing this. The memory cannot, from all its ſtores, caſt up any image that nearly reſembles this ſtrange appearance. If by ſome of its qualities it ſeems to reſemble, and to be connected with a ſpecies which we have before been acquainted with, it is by others ſeparated and detached from

that, and from all the other aſſortments of things we have hitherto been able to make. It ſtands alone and by itſelf in the imagination, and refuſes to be grouped or confounded with any ſet of objects whatever. The imagination and memory exert themſelves to no purpoſe, and in vain look around all their claſſes of ideas in order to find one under which it may be arranged. They fluctuate to no purpoſe from thought to thought, and we remain ſtill uncertain and undetermined where to place it, or what to think of it. It is this fluctuation and vain recollection, together with the emotion or movement of the ſpirits that they excite, which conſtitute the ſentiment properly called *Wonder*, and which occaſion that ſtaring, and ſometimes that rolling of the eyes, that ſuſpenſion of the breath, and that ſwelling of the heart, which we may all obſerve, both in ourſelves and others, when wondering at ſome new object, and which are the natural ſymptoms of uncertain and undetermined thought. What ſort of a thing can that be? What is that like? are the queſtions which, upon ſuch an occaſion, we are all naturally diſpoſed to aſk. If we can recollect many ſuch objects which exactly reſemble this new appearance, and which preſent themſelves to the imagination naturally, and as it were of their own accord, our Wonder is entirely at an end. If we can recollect but a few, and which it requires too ſome trouble to be able to call up, our Wonder is indeed diminiſhed, but not quite deſtroyed. If we can recollect none, but are quite at a loſs, it is the greateſt poſſible.

With what curious attention does a naturaliſt examine a ſingular plant, or a ſingular foſſil, that is preſented to him? He is at no loſs to refer it to the general genus of plants or foſſils; but this does not ſatisfy him, and when he conſiders all the different tribes or ſpecies of either with which he has hitherto been acquainted, they all, he thinks, refuſe to admit the new object among them. It ſtands alone in his imagination, and as it were detached from all the other ſpecies

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of that genus to which it belongs. He labours, however, to connect it with ſome one or other of them. Sometimes he thinks it may be placed in this, and ſometimes in that other aſſortment; nor is he ever ſatisfied, till he has fallen upon one which, in moſt of its qualities, it reſembles. When he cannot do this, rather than it ſhould ſtand quite by itſelf, he will enlarge the precincts, if I may ſay ſo, of ſome ſpecies, in order to make room for it; or he will create a new ſpecies on purpoſe to receive it, and call it a Play of Nature, or give it ſome other appellation, under which he arranges all the oddities that he knows not what elſe to do with. But to ſome claſs or other of known objects he muſt refer it, and betwixt it and them he muſt find out ſome reſemblance or other, before he can get rid of that Wonder, that uncertainty and anxious curioſity excited by its ſingular appearance, and by its diſſimilitude with all the objects he had hitherto obſerved.

As ſingle and individual objects thus excite our Wonder when, by their uncommon qualities and ſingular appearance, they make us uncertain to what ſpecies of things we ought to refer them; ſo a ſucceſſion of objects which follow one another in an uncommon train or order, will produce the ſame effect, though there be nothing particular in any one of them taken by itſelf.

When one accuſtomed object appears after another, which it does not uſually follow, it firſt excites, by its unexpectedneſs, the ſentiment properly called Surpriſe, and afterwards, by the ſingularity of the ſucceſſion, or order of its appearance, the ſentiment properly called Wonder. We ſtart and are ſurpriſed at ſeeing it there, and then wonder how it came there. The motion of a ſmall piece of iron along a plain table is in itſelf no extraordinary object, yet the perſon who firſt ſaw it begin, without any viſible impulſe, in conſequence of the motion of a loadſtone at ſome little diſtance from it,

could not behold it without the moſt extreme Surpriſe; and when that momentary emotion was over, he would ſtill wonder how it came to be conjoined to an event with which, according to the ordinary train of things, he could have ſo little ſuſpected it to have any connection.

When two objects, however unlike, have often been obſerved to follow each other, and have conſtantly preſented themſelves to the ſenſes in that order, they come to be ſo connected together in the fancy, that the idea of the one ſeems, of its own accord, to call up and introduce that of the other. If the objects are ſtill obſerved to ſucceed each other as before, this connection, or, as it has been called, this aſſociation of their ideas, becomes ſtricter and ſtricter, and the habit of the imagination to paſs from the conception of the one to that of the other, grows more and more rivetted and confirmed. As its ideas move more rapidly than external objects, it is continually running before them, and therefore anticipates, before it happens, every event which falls out according to this ordinary courſe of things. When objects ſucceed each other in the ſame train in which the ideas of the imagination have thus been accuſtomed to move, and in which, though not conducted by that chain of events preſented to the ſenſes, they have acquired a tendency to go on of their own accord, ſuch objects appear all cloſely connected with one another, and the thought glides eaſily along them, without effort and without interruption. They fall in with the natural career of the imagination; and as the ideas which repreſented ſuch a train of things would ſeem all mutually to introduce each other, every laſt thought to be called up by the foregoing, and to call up the ſucceeding; ſo when the objects themſelves occur, every laſt event ſeems, in the ſame manner, to be introduced by the foregoing, and to introduce the ſucceeding. There is no break, no ſtop, no gap, no interval. The ideas excited by ſo coherent a chain of things ſeem,

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as it were, to float through the mind of their own accord, without obliging it to exert itſelf, or to make any effort in order to paſs from one of them to another.

But if this cuſtomary connection be interrupted, if one or more objects appear in an order quite different from that to which the imagination has been accuſtomed, and for which it is prepared, the contrary of all this happens. We are at firſt ſurpriſed by the unexpectedneſs of the new appearance, and when that momentary emotion is over, we ſtill wonder how it came to occur in that place. The imagination no longer feels the uſual facility of paſſing from the event which goes before to that which comes after. It is an order or law of ſucceſſion to which it has not been accuſtomed, and which it therefore finds ſome difficulty in following, or in attending to. The fancy is ſtopped and interrupted in that natural movement or career, according to which it was proceeding. Thoſe two events ſeem to ſtand at a diſtance from each other; it endeavours to bring them together, but they refuſe to unite; and it feels, or imagines it feels, ſomething like a gap or interval betwixt them. It naturally heſitates, and, as it were, pauſes upon the brink of this interval; it endeavours to find out ſomething which may fill up the gap, which, like a bridge, may ſo far at leaſt unite thoſe ſeemingly diſtant objects, as to render the paſſage of the thought betwixt them ſmooth, and natural, and eaſy. The ſuppoſition of a chain of intermediate, though inviſible, events, which ſucceed each other in a train ſimilar to that in which the imagination has been accuſtomed to move, and which link together thoſe two disjointed appearances, is the only means by which the imagination can fill up this interval, is the only bridge which, if one may ſay ſo, can ſmooth its paſſage from the one object to the other. Thus, when we obſerve the motion of the iron, in conſequence of that of the loadſtone, we gaze and heſitate, and feel a want of connection betwixt two events which

which follow one another in ſo unuſual a train. But when, with Des Cartes, we imagine certain inviſible effluvia to circulate round one of them, and by their repeated impulſes to impel the other, both to move towards it, and to follow its motion, we fill up the interval betwixt them, we join them together by a ſort of bridge, and thus take off that heſitation and difficulty which the imagination felt in paſſing from the one to the other. That the iron ſhould move after the loadſtone ſeems, upon this hypotheſis, in ſome meaſure according to the ordinary courſe of things. Motion after impulſe is an order of ſucceſſion with which of all things we are the moſt familiar. Two objects which are ſo connected ſeem no longer to be disjoined, and the imagination flows ſmoothly and eaſily along them.

Such is the nature of this ſecond ſpecies of Wonder, which ariſes from an unuſual ſucceſſion of things. The ſtop which is thereby given to the career of the imagination, the difficulty which it finds in paſſing along ſuch disjointed objects, and the feeling of ſomething like a gap or interval betwixt them, conſtitute the whole eſſence of this emotion. Upon the clear diſcovery of a connecting chain of intermediate events, it vaniſhes altogether. What obſtructed the movement of the imagination is then removed. Who wonders at the machinery of the opera-houſe who has once been admitted behind the ſcenes? In the Wonders of nature, however, it rarely happens that we can diſcover ſo clearly this connecting chain. With regard to a few even of them, indeed, we ſeem to have been really admitted behind the ſcenes, and our Wonder accordingly is entirely at an end. Thus the eclipſes of the ſun and moon, which once, more than all the other appearances in the heavens, excited the terror and amazement of mankind, ſeem now no longer to be wonderful, ſince the connecting chain has been found out which joins them to the ordinary courſe of things. Nay, in thoſe caſes in which we have been leſs ſucceſsful, even the vague

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hypotheſes of Des Cartes, and the yet more indetermined notions of Ariſtotle, have, with their followers, contributed to give ſome coherence to the appearances of nature, and might diminiſh, though they could not deſtroy, their Wonder. If they did not completely fill up the interval betwixt the two disjointed objects, they beſtowed upon them, however, ſome ſort of looſe connection, which they wanted before.

That the imagination feels a real difficulty in paſſing along two events which follow one another in an uncommon order, may be confirmed by many obvious obſervations. If it attempts to attend beyond a certain time to a long ſeries of this kind, the continual efforts it is obliged to make, in order to paſs from one object to another, and thus follow the progreſs of the ſucceſſion, ſoon fatigue it, and if repeated too often, diſorder and disjoint its whole frame. It is thus that too ſevere an application to ſtudy ſometimes brings on lunacy and frenzy, in thoſe eſpecially who are ſomewhat advanced in life, but whoſe imaginations, from being too late in applying, have not got thoſe habits which diſpoſe them to follow eaſily the reaſonings in the abſtract ſciences. Every ſtep of a demonſtration, which to an old practitioner is quite natural and eaſy, requires from them the moſt intenſe application of thought. Spurred on, however, either by ambition, or by admiration for the ſubject, they ſtill continue till they become, firſt confuſed, then giddy, and at laſt diſtracted. Could we conceive a perſon of the ſoundeſt judgment, who had grown up to maturity, and whoſe imagination had acquired thoſe habits, and that mold, which the conſtitution of things in this world neceſſarily impreſs upon it, to be all at once tranſported alive to ſome other planet, where nature was governed by laws quite different from thoſe which take place here; as he would be continually obliged to attend to events, which muſt to him appear in the higheſt degree jarring, irregular, and diſcordant, he would ſoon feel the

ſame confuſion and giddineſs begin to come upon him, which would at laſt end in the ſame manner, in lunacy and diſtraction. Neither, to produce this effect, is it neceſſary that the objects ſhould be either great or intereſting, or even uncommon, in themſelves. It is ſufficient that they follow one another in an uncommon order. Let any one attempt to look over even a game of cards, and to attend particularly to every ſingle ſtroke, and if he is unacquainted with the nature and rules of the game; that is, with the laws which regulate the ſucceſſion of the cards; he will ſoon feel the ſame confuſion and giddineſs begin to come upon him, which, were it to be continued for days and months, would end in the ſame manner, in lunacy and diſtraction. But if the mind be thus thrown into the moſt violent diſorder, when it attends to a long ſeries of events which follow one another in an uncommon train, it muſt feel ſome degree of the ſame diſorder, when it obſerves even a ſingle event fall out in this unuſual manner: for the violent diſorder can ariſe from nothing but the too frequent repetition of this ſmaller uneaſineſs.

That it is the unuſualneſs alone of the ſucceſſion which occaſions this ſtop and interruption in the progreſs of the imagination, as well as the notion of an interval betwixt the two immediately ſucceeding objects, to be filled up by ſome chain of intermediate events, is not leſs evident. The ſame orders of ſucceſſion, which to one ſet of men ſeem quite according to the natural courſe of things, and ſuch as require no intermediate events to join them, ſhall to another appear altogether incoherent and disjointed, unleſs ſome ſuch events be ſuppoſed: and this for no other reaſon, but becauſe ſuch orders of ſucceſſion are familiar to the one, and ſtrange to the other. When we enter the work-houſes of the moſt common artizans; ſuch as dyers, brewers, diſtillers; we obſerve a number of appearances, which preſent themſelves in an order that ſeems to us very ſtrange and wonderful. Our thought cannot eaſily follow it; we feel an

interval betwixt every two of them, and require ſome chain of intermediate events, to fill it up, and link them together. But the artizan himſelf, who has been for many years familiar with the conſequences of all the operations of his art, feels no ſuch interval. They fall in with what cuſtom has made the natural movement of his imagination: they no longer excite his Wonder, and if he is not a genius ſuperior to his profeſſion, ſo as to be capable of making the very eaſy reflection, that thoſe things, though familiar to him, may be ſtrange to us, he will be diſpoſed rather to laugh at, than ſympathize with our Wonder. He cannot conceive what occaſion there is for any connecting events to unite thoſe appearances, which ſeem to him to ſucceed each other very naturally. It is their nature, he tells us, to follow one another in this order, and that accordingly they always do ſo. In the ſame manner bread has, ſince the world began, been the common nouriſhment of the human body, and men have ſo long ſeen it, every day, converted into fleſh and bones, ſubſtances in all reſpects ſo unlike it, that they have ſeldom had the curioſity to inquire by what proceſs of intermediate events this change is brought about. Becauſe the paſſage of the thought from the one object to the other is by cuſtom become quite ſmooth and eaſy, almoſt without the ſuppoſition of any ſuch proceſs. Philoſophers, indeed, who often look for a chain of inviſible objects to join together two events that occur in an order familiar to all the world, have endeavoured to find out a chain of this kind betwixt the two events I have juſt now mentioned; in the ſame manner as they have endeavoured, by a like intermediate chain, to connect the gravity, the elaſticity, and even the coheſion of natural bodies, with ſome of their other qualities. Theſe, however, are all of them ſuch combinations of events as give no ſtop to the imaginations of the bulk of mankind, as excite no Wonder, nor any apprehenſion that there is wanting the ſtricteſt connection between them. But as in thoſe ſounds, which to the greater part of men ſeem perfectly agreeable to meaſure

and harmony, the nicer ear of a muſician will diſcover a want, both of the moſt exact time, and of the moſt perfect coincidence: ſo the more practiſed thought of a philoſopher, who has ſpent his whole life in the ſtudy of the connecting principles of nature, will often feel an interval betwixt two objects, which, to more careleſs obſervers, ſeem very ſtrictly conjoined. By long attention to all the connections which have ever been preſented to his obſervation, by having often compared them with one another, he has, like the muſician, acquired, if one may ſay ſo, a nicer ear, and a more delicate feeling with regard to things of this nature. And as to the one, that muſic ſeems diſſonance which falls ſhort of the moſt perfect harmony; ſo to the other, thoſe events ſeem altogether ſeparated and disjoined, which fall ſhort of the ſtricteſt and moſt perfect connection.

Philoſophy is the ſcience of the connecting principles of nature. Nature, after the largeſt experience that common obſervation can acquire, ſeems to abound with events which appear ſolitary and incoherent with all that go before them, which therefore diſturb the eaſy movement of the imagination; which make its ideas ſucceed each other, if one may ſay ſo, by irregular ſtarts and ſallies; and which thus tend, in ſome meaſure, to introduce thoſe confuſions and diſtractions we formerly mentioned. Philoſophy, by repreſenting the inviſible chains which bind together all theſe disjointed objects, endeavours to introduce order into this chaos of jarring and diſcordant appearances, to allay this tumult of the imagination, and to reſtore it, when it ſurveys the great revolutions of the univerſe, to that tone of tranquillity and compoſure, which is both moſt agreeable in itſelf, and moſt ſuitable to its nature. Philoſophy, therefore, may be regarded as one of thoſe arts which addreſs themſelves to the imagination; and whoſe theory and hiſtory, upon that account, fall properly within the circumference of our ſubject. Let us endeavour to trace it from its firſt origin, up to that ſummit of perfection to which

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it is at preſent ſuppoſed to have arrived, and to which, indeed, it has equally been ſuppoſed to have arrived in almoſt all former times. It is the moſt ſublime of all the agreeable arts, and its revolutions have been the greateſt, the moſt frequent, and the moſt diſtinguiſhed of all thoſe that have happened in the literary world. Its hiſtory, therefore, muſt, upon all accounts, be the moſt entertaining and the moſt inſtructive. Let us examine, therefore, all the different ſyſtems of nature, which, in theſe weſtern parts of the world, the only parts of whoſe hiſtory we know any thing, have ſucceſſively been adopted by the learned and ingenious; and, without regarding their abſurdity or probability, their agreement or inconſiſtency with truth and reality, let us conſider them only in that particular point of view which belongs to our ſubject; and content ourſelves with inquiring how far each of them was fitted to ſooth the imagination, and to render the theatre of nature a more coherent, and therefore a more magnificent ſpectacle, than otherwiſe it would have appeared to be. According as they have failed or ſucceeded in this, they have conſtantly failed or ſucceeded in gaining reputation and renown to their authors; and this will be found to be the clew that is moſt capable of conducting us through all the labyrinths of philoſophical hiſtory: for, in the mean time, it will ſerve to confirm what has gone before, and to throw light upon what is to come after, that we obſerve, in general, that no ſyſtem, how well ſoever in other reſpects ſupported, has ever been able to gain any general credit on the world, whoſe connecting principles were not ſuch as were familiar to all mankind. Why has the chemical philoſophy in all ages crept along in obſcurity, and been ſo diſregarded by the generality of mankind, while other ſyſtems, leſs uſeful, and not more agreeable to experience, have poſſeſſed univerſal admiration for whole centuries together? The connecting principles of the chemical philoſophy are ſuch as the generality of mankind know nothing about, have rarely ſeen, and have never been acquainted with; and which to them, therefore, are incapable of

ſmoothing the paſſage of the imagination betwixt any two ſeemingly disjointed objects. Salts, ſulphurs, and mercuries, acids, and alkalis, are principles which can ſmooth things to thoſe only who live about the furnace; but whoſe moſt common operations ſeem, to the bulk of mankind, as disjointed as any two events which the chemiſts would connect together by them. Thoſe artiſts, however, naturally explained things to themſelves by principles that were familiar to themſelves. As Ariſtotle obſerves, that the early Pythagoreans, who firſt ſtudied arithmetic, explained all things by the properties of numbers; and Cicero tells us, that Ariſtoxenus, the muſician, found the nature of the ſoul to conſiſt in harmony. In the ſame manner, a learned phyſician lately gave a ſyſtem of moral philoſophy upon the the principles of his own art, in which wiſdom and virtue were the healthful ſtate of the ſoul; the different vices and follies, the different diſeaſes to which it was ſubject; in which the cauſes and ſymptoms of thoſe diſeaſes were aſcertained; and, in the ſame medical ſtrain, a proper method of cure preſcribed. In the ſame manner alſo, others have written parallels of painting and poetry, of poetry and muſic, of muſic and architecture, of beauty and virtue, of all the fine arts; ſyſtems which have univerſally owed their origin to the lucubrations of thoſe who were acquainted with the one art, but ignorant of the other; who therefore explained to themſelves the phænomena, in that which was ſtrange to them, by thoſe in that which was familiar; and with whom, upon that account, the analogy, which in other writers gives occaſion to a few ingenious ſimilitudes, became the great hinge upon which every thing turned.

SECTION

SECTION III.

Of the Origin of Philoſophy.

MANKIND, in the firſt ages of ſociety, before the eſtabliſhment of law, order, and ſecurity, have little curioſity to find out thoſe hidden chains of events which bind together the ſeemingly diſjointed appearances of nature. A ſavage, whoſe ſubſiſtence is precarious, whoſe life is every day expoſed to the rudeſt dangers, has no inclination to amuſe himſelf with ſearching out what, when diſcovered, ſeems to ſerve no other purpoſe than to render the theatre of nature a more connected ſpectacle to his imagination. Many of theſe ſmaller incoherences, which in the courſe of things perplex philoſophers, entirely eſcape his attention. Thoſe more magnificent irregularities, whoſe grandeur he cannot overlook, call forth his amazement. Comets, eclipſes, thunder, lightning, and other meteors, by their greatneſs, naturally overawe him, and he views them with a reverence that approaches to fear. His inexperience and uncertainty with regard to every thing about them, how they came, how they are to go, what went before, what is to come after them, exaſperate his ſentiment into terror and conſternation. But our paſſions, as Father Malbranche obſerves, all juſtify themſelves; that is, ſuggeſt to us opinions which juſtify them. As thoſe appearances terrify him, therefore, he is diſpoſed to believe every thing about them which can render them ſtill more the objects of his terror. That they proceed from ſome intelligent, though inviſible cauſes, of whoſe vengeance and diſpleaſure they are either the ſigns or the effects, is the notion of all others moſt capable of enhancing this paſſion, and is that, therefore, which he is moſt apt to entertain. To this too, that cowardice and puſillanimity, ſo natural to man in his uncivilized ſtate,

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ſtill more diſpoſes him; unprotected by the laws of ſociety, expoſed, defenceleſs, he feels his weakneſs upon all occaſions; his ſtrength and ſecurity upon none.

But all the irregularities of nature are not of this awful or terrible kind. Some of them are perfectly beautiful and agreeable. Theſe, therefore, from the ſame impotence of mind, would be beheld with love and complacency, and even with tranſports of gratitude; for whatever is the cauſe of pleaſure naturally excites our gratitude. A child careſſes the fruit that is agreeable to it, as it beats the ſtone that hurts it. The notions of a ſavage are not very different. The ancient Athenians, who ſolemnly puniſhed the axe which had accidentally been the cauſe of the death of a man, erected altars, and offered ſacrifices to the rainbow. Sentiments not unlike theſe, may ſometimes, upon ſuch occaſions, begin to be felt even in the breaſts of the moſt civilized, but are preſently checked by the reflection, that the things are not their proper objects. But a ſavage, whoſe notions are guided altogether by wild nature and paſſion, waits for no other proof that a thing is the proper object of any ſentiment, than that it excites it. The reverence and gratitude, with which ſome of the appearances of nature inſpire him, convince him that they are the proper objects of reverence and gratitude, and therefore proceed from ſome intelligent beings, who take pleaſure in the expreſſions of thoſe ſentiments. With him, therefore, every object of nature, which by its beauty or greatneſs, its utility or hurtfulneſs, is conſiderable enough to attract his attention, and whoſe operations are not perfectly regular, is ſuppoſed to act by the direction of ſome inviſible and deſigning power. The ſea is ſpread out into a calm, or heaved into a ſtorm, according to the good pleaſure of Neptune. Does the earth pour forth an exuberant harveſt? It is owing to the indulgence of Ceres. Does the vine yield a plentiful vintage? It flows from the bounty of Bacchus. Do either refuſe their preſents?

preſents? It is aſcribed to the diſpleaſure of thoſe offended deities. The tree, which now flouriſhes, and now decays, is inhabited by a Dryad, upon whoſe health or ſickneſs its various appearances depend. The fountain, which ſometimes flows in a copious, and ſometimes in a ſcanty ſtream, which appears ſometimes clear and limpid, and at other times muddy and diſturbed, is affected in all its changes by the Naiad who dwells within it. Hence the origin of Polytheiſm, and of that vulgar ſuperſtition which aſcribes all the irregular events of nature to the favour or diſpleaſure of intelligent, though inviſible beings, to gods, dæmons, witches, genii, fairies. For it may be obſerved, that in all Polytheiſtic religions, among ſavages, as well as in the early ages of Heathen antiquity, it is the irregular events of nature only that are aſcribed to the agency and power of their gods. Fire burns, and water refreſhes; heavy bodies deſcend, and lighter ſubſtances fly upwards, by the neceſſity of their own nature; nor was the inviſible hand of Jupiter ever apprehended to be employed in thoſe matters. But thunder and lightning, ſtorms and ſunſhine, thoſe more irregular events, were aſcribed to his favour, or his anger. Man, the only deſigning power with which they were acquainted, never acts but either to ſtop, or to alter the courſe, which natural events would take, if left to themſelves. Thoſe other intelligent beings, whom they imagined, but knew not, were naturally ſuppoſed to act in the ſame manner; not to employ themſelves in ſupporting the ordinary courſe of things, which went on of its own accord, but to ſtop, to thwart, and to diſturb it. And thus, in the firſt ages of the world, the loweſt and moſt puſillanimous ſuperſtition ſupplied the place of philoſophy.

But when law has eſtabliſhed order and ſecurity, and ſubſiſtence ceaſes to be precarious, the curioſity of mankind is increaſed, and their fears are diminiſhed. The leiſure which they then enjoy renders them more attentive to the appearances of nature, more obſerv-

ant of her ſmalleſt irregularities, and more deſirous to know what is the chain which links them all together. That ſome ſuch chain ſubſiſts betwixt all her ſeemingly disjointed phœnomena, they are neceſſarily led to conceive; and that magnanimity, and cheerfulneſs, which all generous natures acquire who are bred in civilized ſocieties, where they have ſo few occaſions to feel their weakneſs, and ſo many to be conſcious of their ſtrength and ſecurity, renders them leſs diſpoſed to employ, for this connecting chain, thoſe inviſible beings whom the fear and ignorance of their rude forefathers had engendered. Thoſe of liberal fortunes, whoſe attention is not much occupied either with buſineſs or with pleaſure, can fill up the void of their imagination, which is thus diſengaged from the ordinary affairs of life, no other way than by attending to that train of events which paſſes around them. While the great objects of nature thus paſs in review before them, many things occur in an order to which they have not been accuſtomed. Their imagination, which accompanies with eaſe and delight the regular progreſs of nature, is ſtopped and embarraſſed by thoſe ſeeming incoherences; they excite their wonder, and ſeem to require ſome chain of intermediate events, which, by connecting them with ſomething that has gone before, may thus render the whole courſe of the univerſe conſiſtent and of a piece. Wonder, therefore, and not any expectation of advantage from its diſcoveries, is the firſt principle which prompts mankind to the ſtudy of Philoſophy, of that ſcience which pretends to lay open the concealed connections that unite the various appearances of nature; and they purſue this ſtudy for its own ſake, as an original pleaſure or good in itſelf, without regarding its tendency to procure them the means of many other pleaſures.

Greece, and the Greek colonies in Sicily, Italy, and the Leſſer Aſia, were the firſt countries which, in theſe weſtern parts of the world, arrived at a ſtate of civilized ſociety. It was in them, there-

fore,

ſore, that the firſt philoſophers, of whoſe doctrine we have any diſtinct account, appeared. Law and order ſeem indeed to have been eſtabliſhed in the great monarchies of Aſia and Egypt, long before they had any footing in Greece: yet, after all that has been ſaid concerning the learning of the Chaldeans and Egyptians, whether there ever was in thoſe nations any thing which deſerved the name of ſcience, or whether that deſpotiſm which is more deſtructive of ſecurity and leiſure than anarchy itſelf, and which prevailed over all the Eaſt, prevented the growth of Philoſophy, is a queſtion which, for want of monuments, cannot be determined with any degree of preciſion.

The Greek colonies having been ſettled amid nations either altogether barbarous, or altogether unwarlike, over whom, therefore, they ſoon acquired a very great authority, ſeem, upon that account, to have arrived at a conſiderable degree of empire and opulence before any ſtate in the parent country had ſurmounted that extreme poverty, which, by leaving no room for any evident diſtinction of ranks, is neceſſarily attended with the confuſion and miſrule which flows from a want of all regular ſubordination. The Greek iſlands being ſecure from the invaſion of land armies, or from naval forces, which were in thoſe days but little known, ſeem, upon that account too, to have got before the continent in all ſorts of civility and improvement. The firſt philoſophers, therefore, as well as the firſt poets, ſeem all to have been natives, either of their colonies, or of their iſlands. It was from thence that Homer, Archilochus, Steſichorus, Simonides, Sappho, Anacreon, derived their birth. Thales and Pythagoras, the founders of the two earlieſt ſects of philoſophy, aroſe, the one in an Aſiatic colony, the other in an iſland; and neither of them eſtabliſhed his ſchool in the mother country.

What was the particular ſyſtem of either of thoſe two philoſophers, or whether their doctrine was ſo methodized as to deſerve the name of a ſyſtem, the imperfection, as well as the uncertainty of all the traditions that have come down to us concerning them, makes it impoſſible to determine. The ſchool of Pythagoras, however, ſeems to have advanced further in the ſtudy of the connecting principles of nature, than that of the Ionian philoſopher. The accounts which are given of Anaximander, Anaximenes, Anaxagoras, Archelaus, the ſucceſſors of Thales, repreſent the doctrines of thoſe ſages as full of the moſt inextricable confuſion. Something, however, that approaches to a compoſed and orderly ſyſtem, may be traced in what is delivered down to us concerning the doctrine of Empedocles, of Archytas, of Timæus, and of Ocellus the Lucanian, the moſt renowned philoſophers of the Italian ſchool. The opinions of the two laſt coincide pretty much; the one, with thoſe of Plato; the other, with thoſe of Ariſtotle; nor do thoſe of the two firſt ſeem to have been very different, of whom the one was the author of the doctrine of the Four Elements, the other the inventor of the Categories; who, therefore, may be regarded as the founders, the one, of the ancient Phyſics; the other, of the ancient Dialectic; and, how cloſely theſe were connected, will appear hereafter. It was in the ſchool of Socrates, however, from Plato and Ariſtotle, that Philoſophy firſt received that form, which introduced her, if one may ſay ſo, to the general acquaintance of the world. It is from them, therefore, that we ſhall begin to give her hiſtory in any detail. Whatever was valuable in the former ſyſtems, which was at all conſiſtent with their general principles, they ſeem to have conſolidated into their own. From the Ionian Philoſophy, I have not been able to diſcover that they derived any thing. From the Pythagorean ſchool, both Plato and Ariſtotle ſeem to have derived the fundamental principles of almoſt all their doctrines. Plato, too, appears to have borrowed

ſomething from two other ſects of philoſophers, whoſe extreme obſcurity ſeems to have prevented them from acquiring themſelves any extenſive reputation: the one was that of Cratylus and Heraclitus; the other was that of Xenophanes, Parmenides, Meliſſus, and Zeno. To pretend to reſcue the ſyſtem of any of thoſe anteſocratic ſages, from that oblivion which at preſent covers them all, would be a vain and uſeleſs attempt. What ſeems, however, to have been borrowed from them, ſhall ſometimes be marked as we go along.

There was ſtill another ſchool of philoſophy, earlier than Plato, from which, however, he was ſo far from borrowing any thing, that he ſeems to have bent the whole force of his reaſon to diſcredit and expoſe its principles. This was the Philoſophy of Leucippus, Democritus, and Protagoras, which accordingly ſeems to have ſubmitted to his eloquence, to have lain dormant, and to have been almoſt forgotten for ſome generations, till it was afterwards more ſucceſsfully revived by Epicurus.

SECTION IV.

The Hiſtory of Aſtronomy.

Of all the phœnomena of nature, the celeſtial appearances are, by their greatneſs and beauty, the moſt univerſal objects of the curioſity of mankind. Thoſe who ſurveyed the heavens with the moſt careleſs attention, neceſſarily diſtinguiſhed in them three different ſorts of objects; the Sun, the Moon, and the Stars. Theſe laſt, appearing always in the ſame ſituation, and at the ſame diſtance with regard to one another, and ſeeming to revolve every day round the earth in parallel circles, which widened gradually from the poles to the equator, were naturally thought to have all the marks of being fixed, like

like ſo many gems, in the concave ſide of the firmament, and of being carried round by the diurnal revolutions of that ſolid body: for the azure ſky, in which the ſtars ſeem to float, was readily apprehended, upon account of the uniformity of their apparent motions, to be a ſolid body, the roof or outer wall of the univerſe, to whoſe inſide all thoſe little ſparkling objects were attached.

The Sun and Moon, often changing their diſtance and ſituation, in regard to the other heavenly bodies, could not be apprehended to be attached to the ſame ſphere with them. They aſſigned, therefore, to each of them, a ſphere of its own; that is, ſuppoſed each of them to be attached to the concave ſide of a ſolid and tranſparent body, by whoſe revolutions they were carried round the earth. There was not indeed, in this caſe, the ſame ground for the ſuppoſition of ſuch a ſphere as in that of the Fixed Stars; for neither the Sun nor the Moon appear to keep always at the ſame diſtance with regard to any one of the other heavenly bodies. But as the motion of the Stars had been accounted for by an hypotheſis of this kind, it rendered the theory of the heavens more uniform, to account for that of the Sun and Moon in the ſame manner. The ſphere of the Sun they placed above that of the Moon; as the Moon was evidently ſeen in eclipſes to paſs betwixt the Sun and the Earth. Each of them was ſuppoſed to revolve by a motion of its own, and at the ſame time to be affected by the motion of the Fixed Stars. Thus, the Sun was carried round from eaſt to weſt by the communicated movement of this outer ſphere, which produced his diurnal revolutions, and the viciſſitudes of day and night; but at the ſame time he had a motion of his own, contrary to this, from weſt to eaſt, which occaſioned his annual revolution, and the continual ſhifting of his place with regard to the Fixed Stars. This motion was more eaſy, they thought, when carried on edgeways, and not in direct oppoſition to the motion of the outer ſphere, which occaſioned the inclination

clination of the axis of the ſphere of the Sun, to that of the ſphere of the Fixed Stars; this again produced the obliquity of the ecliptic, and the conſequent changes of the ſeaſons. The moon, being placed below the ſphere of the Sun, had both a ſhorter courſe to finiſh, and was leſs obſtructed by the contrary movement of the ſphere of the Fixed Stars, from which ſhe was farther removed. She finiſhed her period, therefore, in a ſhorter time, and required but a month, inſtead of a year, to complete it.

The Stars, when more attentively ſurveyed, were ſome of them obſerved to be leſs conſtant and uniform in their motions than the reſt, and to change their ſituations with regard to the other heavenly bodies; moving generally eaſtwards, yet appearing ſometimes to ſtand ſtill, and ſometimes even to move weſtwards. Theſe, to the number of five, were diſtinguiſhed by the name of Planets, or wandering Stars, and marked with the particular appellations of Saturn, Jupiter, Mars, Venus, and Mercury. As, like the Sun and Moon, they ſeem to accompany the motion of the Fixed Stars from eaſt to weſt, but at the ſame time to have a motion of their own, which is generally from weſt to eaſt; they were each of them, as well as thoſe two great lamps of heaven, apprehended to be attached to the inſide of a ſolid concave and tranſparent ſphere, which had a revolution of its own, that was almoſt directly contrary to the revolution of the outer heaven, but which, at the ſame time, was hurried along by the ſuperior violence and rapidity of this laſt.

This is the ſyſtem of concentric Spheres, the firſt regular ſyſtem of Aſtronomy, which the world beheld, as it was taught in the Italian ſchool before Ariſtotle and his two cotemporary philoſophers, Eudoxus and Callippus, had given it all the perfection which it is capable of receiving. Though rude and inartificial, it is capable of connecting together, in the imagination, the grandeſt and the moſt

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ſeemingly disjointed appearances in the heavens. The motions of the moſt remarkable objects in the celeſtial regions, the Sun, the Moon, and the Fixed Stars, are ſufficiently connected with one another by this hypotheſis. The eclipſes of theſe two great luminaries are, though not ſo eaſily calculated, as eaſily explained, upon this ancient, as upon the modern ſyſtem. When theſe early philoſophers explained to their diſciples the very ſimple cauſes of thoſe dreadful phœnomena, it was under the ſeal of the moſt ſacred ſecrecy, that they might avoid the fury of the people, and not incur the imputation of impiety, when they thus took from the gods the direction of thoſe events, which were apprehended to be the moſt terrible tokens of their impending vengeance. The obliquity of the ecliptic, the conſequent changes of the ſeaſons, the viciſſitudes of day and night, and the different lengths of both days and nights, in the different ſeaſons, correſpond too, pretty exactly, with this ancient doctrine. And if there had been no other bodies diſcoverable in the heavens beſides the Sun, the Moon, and the Fixed Stars, this old hypotheſis might have ſtood the examination of all ages, and have gone down triumphant to the remoteſt poſterity.

If it gained the belief of mankind by its plauſibility, it attracted their wonder and admiration; ſentiments that ſtill more confirmed their belief, by the novelty and beauty of that view of nature which it preſented to the imagination. Before this ſyſtem was taught in the world, the earth was regarded as, what it appears to the eye, a vaſt, rough, and irregular plain, the baſis and foundation of the univerſe, ſurrounded on all ſides by the ocean, and whoſe roots extended themſelves through the whole of that infinite depth which is below it. The ſky was conſidered as a ſolid hemiſphere, which covered the earth, and united with the ocean at the extremity of the horizon. The Sun, the Moon, and all the heavenly bodies roſe out of the eaſtern, climbed up the convex ſide of the heavens, and de-

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ſcended again into the weſtern ocean, and from thence, by ſome ſubterraneous paſſages, returned to their firſt chambers in the eaſt. Nor was this notion confined to the people, or to the poets who painted the opinions of the people; it was held by Xenophanes, the founder of the Eleatic philoſophy, after that of the Ionian and Italian ſchools, the earlieſt that appeared in Greece. Thales of Miletus too, who, according to Ariſtotle, repreſented the Earth as floating upon an immenſe ocean of water, may have been nearly of the ſame opinion; notwithſtanding what we are told by Plutarch and Apuleius concerning his aſtronomical diſcoveries, all of which muſt plainly have been of a much later date. To thoſe who had no other idea of nature, beſides what they derived from ſo confuſed an account of things, how agreeable muſt that ſyſtem have appeared, which repreſented the Earth as diſtinguiſhed into land and water, ſelf-balanced and ſuſpended in the centre of the univerſe, ſurrounded by the elements of Air and Ether, and covered by eight poliſhed and criſtalline Spheres, each of which was diſtinguiſhed by one or more beautiful and luminous bodies, and all of which revolved round their common centre, by varied, but by equable and proportionable motions. It ſeems to have been the beauty of this ſyſtem that gave Plato the notion of ſomething like an harmonic proportion, to be diſcovered in the motions and diſtances of the heavenly bodies; and which ſuggeſted to the earlier Pythagoreans, the celebrated fancy of the Muſick of the Spheres: a wild and romantic idea, yet ſuch as does not ill correſpond with that admiration, which ſo beautiful a ſyſtem, recommended too by the graces of novelty, is apt to inſpire.

Whatever are the defects which this account of things labours under, they are ſuch, as to the firſt obſervers of the heavens could not readily occur. If all the motions of the Five Planets cannot, the greater part of them may, be eaſily connected by it; they and all their motions are the leaſt remarkable objects in the heavens; the

greater part of mankind take no notice of them at all; and a ſyſtem, whoſe only defect lies in the account which it gives of them, cannot thereby be much diſgraced in their opinion. If ſome of the appearances too of the Sun and Moon, the ſometimes accelerated and again retarded motions of thoſe luminaries but ill correſpond with it; theſe too, are ſuch as cannot be diſcovered but by the moſt attentive obſervation, and ſuch therefore as we cannot wonder that the imaginations of the firſt enquirers ſhould ſlur over, if one may ſay ſo, and take little notice of.

It was, however, to remedy thoſe defects, that Eudoxus, the friend and auditor of Plato, found it neceſſary to increaſe the number of the Celeſtial Spheres. Each Planet is ſometimes obſerved to advance forward in that eaſtward courſe which is peculiar to itſelf, ſometimes to retire backwards, and ſometimes again to ſtand ſtill. To ſuppoſe that the Sphere of the Planet ſhould by its own motion, if one may ſay ſo, ſometimes roll forwards, ſometimes roll backwards, and ſometimes do neither the one nor the other, is contrary to all the natural propenſities of the imagination, which accompanies with eaſe and delight any regular and orderly motion, but feels itſelf perpetually ſtopped and interrupted, when it endeavours to attend to one ſo deſultory and uncertain. It would purſue, naturally and of its own accord, the direct or progreſſive movement of the Sphere, but is every now and then ſhocked, if one may ſay ſo, and turned violently out of its natural career by the retrograde and ſtationary appearances of the Planet, betwixt which and its more uſual motion, the fancy feels a want of connection, a gap or interval, which it cannot fill up, but by ſuppoſing ſome chain of intermediate events to join them. The hypotheſis of a number of other ſpheres revolving in the heavens, beſides thoſe in which the luminous bodies themſelves were infixed, was the chain with which Eudoxus endeavoured to ſupply it. He beſtowed four of theſe

Spheres

Spheres upon each of the Five Planets; one in which the luminous body itſelf revolved, and three others above it. Each of theſe had a regular and conſtant, but a peculiar movement of its own, which it communicated to what was properly the Sphere of the Planet, and thus occaſioned that diverſity of motions obſervable in thoſe bodies. One of theſe Spheres, for example, had an oſcillatory motion, like the circular pendulum of a watch. As when you turn round a watch, like a Sphere upon its axis, the pendulum will, while turned round along with it, ſtill continue to oſcillate, and communicate to whatever body is comprehended within it, both its own oſcillations and the circular motion of the watch; ſo this oſcillating Sphere, being itſelf turned round by the motion of the Sphere above it, communicated to the Sphere below it, that circular, as well as its own oſcillatory motion; produced by the one, the daily revolutions; by the other, the direct, ſtationary, and retrograde appearances of the Planet, which derived from a third Sphere that revolution by which it performed its annual period. The motions of all theſe Spheres were in themſelves conſtant and equable, ſuch as the imagination could eaſily attend to and purſue, and which connected together that otherwiſe incoherent diverſity of movements obſervable in the Sphere of the Planet. The motions of the Sun and Moon being more regular than thoſe of the Five Planets, by aſſigning three Spheres to each of them, Eudoxus imagined he could connect together all the diverſity of movements diſcoverable in either. The motion of the Fixed Stars being perfectly regular, one Sphere he judged ſufficient for them all. So that, according to this account, the whole number of Celeſtial Spheres amounted to twenty-ſeven. Callippus, though ſomewhat younger, the cotemporary of Eudoxus, found that even this number was not enough to connect together the vaſt variety of movements which he diſcovered in thoſe bodies, and therefore increaſed it to thirty-four. Ariſtotle, upon a yet more attentive obſervation, found that even all theſe Spheres would not be

ſufficient, and therefore added twenty-two more, which increaſed their number to fifty-ſix. Later obſervers diſcovered ſtill new motions, and new inequalities, in the heavens. New Spheres were therefore ſtill to be added to the ſyſtem, and ſome of them to be placed even above that of the Fixed Stars. So that in the ſixteenth century, when Fracoſtorio, ſmit with the eloquence of Plato and Ariſtotle, and with the regularity and harmony of their ſyſtem, in itſelf perfectly beautiful, though it correſponds but inaccurately with the phænomena, endeavoured to revive this ancient Aſtronomy, which had long given place to that of Ptolemy and Hipparchus, he found it neceſſary to multiply the number of Celeſtial Spheres to ſeventy-two; neither were all theſe enough.

This ſyſtem had now become as intricate and complex as thoſe appearances themſelves, which it had been invented to render uniform and coherent. The imagination, therefore, found itſelf but little relieved from that embarraſſment, into which thoſe appearances had thrown it, by ſo perplexed an account of things. Another ſyſtem, for this reaſon, not long after the days of Ariſtotle, was invented by Apollonius, which was afterwards perfected by Hipparchus, and has ſince been delivered down to us by Ptolemy, the more artificial ſyſtem of Eccentric Spheres and Epicycles.

In this ſyſtem, they firſt diſtinguiſhed betwixt the real and apparent motion of the heavenly bodies. Theſe, they obſerved, upon account of their immenſe diſtance, muſt neceſſarily appear to revolve in circles concentric with the globe of the Earth, and with one another: but that we cannot, therefore, be certain that they really revolve in ſuch circles, ſince, though they did not, they would ſtill have the ſame appearance. By ſuppoſing, therefore, that the Sun and the other Planets revolved in circles, whoſe centres were very diſtant from the centre of the Earth; that conſequently, in the progreſs of their

their revolution, they muſt ſometimes approach nearer, and ſometimes recede further from it, and muſt, therefore, to its inhabitants appear to move faſter in the one caſe, and ſlower in the other, thoſe philoſophers imagined they could account for the apparently unequal velocities of all thoſe bodies.

By ſuppoſing, that in the ſolidity of the Sphere of each of the Five Planets there was formed another little Sphere, called an Epicycle, which revolved round its own centre, at the ſame time that it was carried round the centre of the Earth by the revolution of the great Sphere, betwixt whoſe concave and convex ſides it was incloſed; in the ſame manner as we might ſuppoſe a little wheel incloſed within the outer circle of a great wheel, and which whirled about ſeveral times upon its own axis, while its centre was carried round the axis of the great wheel, they imagined they could account for the retrograde and ſtationary appearances of thoſe moſt irregular objects in the heavens. The Planet, they ſuppoſed, was attached to the circumference, and whirled round the centre of this little Sphere, at the ſame time that it was carried round the Earth by the movement of the great Sphere. The revolution of this little Sphere, or Epicycle, was ſuch, that the Planet, when in the upper part of it; that is, when furtheſt off and leaſt ſenſible to the eye; was carried round in the ſame direction with the centre of the Epicycle, or with the Sphere in which the Epicycle was incloſed: but when in the lower part, that is, when neareſt and moſt ſenſible to the eye; it was carried round in a direction contrary to that of the centre of the Epicycle: in the ſame manner as every point in the upper part of the outer circle of a coach-wheel revolves forward in the ſame direction with the axis, while every point, in the lower part, revolves backwards in a contrary direction to the axis. The motions of the Planet, therefore, ſurveyed from the Earth appeared direct, when in the upper part of the Epicycle, and retrograde, when

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in the lower. When again it either deſcended from the upper part to the lower, or aſcended from the lower to the upper, it neceſſarily appeared ſtationary.

But, though, by the eccentricity of the great Sphere, they were thus able, in ſome meaſure, to connect together the unequal velocities of the heavenly bodies, and by the revolutions of the little Sphere, the direct, ſtationary, and retrograde appearances of the Planets, there was another difficulty that ſtill remained. Neither the Moon, nor the three ſuperior Planets, appear always in the ſame part of the heavens, when at their periods of moſt retarded motion, or when they are ſuppoſed to be at the greateſt diſtance from the Earth. The apogeum therefore, or the point of greateſt diſtance from the Earth, in the Spheres of each of thoſe bodies, muſt have a movement of its own, which may carry it ſucceſſively through all the different points of the Ecliptic. They ſuppoſed, therefore, that while the great eccentric Sphere revolved eaſtwards round its centre, that its centre too revolved weſtwards in a circle of its own, round the centre of the Earth, and thus carried its apogeum through all the different points of the Ecliptic.

But with all thoſe combined and perplexed circles; though the patrons of this ſyſtem were able to give ſome degree of uniformity to the real directions of the Planets, they found it impoſſible ſo to adjuſt the velocities of thoſe ſuppoſed Spheres to the phœnomena, as that the revolution of any one of them, when ſurveyed from its own entre, ſhould appear perfectly equable and uniform. From that point, the only point in which the velocity of what moves in a circle can be truly judged of, they would ſtill appear irregular and inconſtant, and ſuch as tended to embarraſs and confound the imagination. They invented, therefore, for each of them, a new Circle, called the Equalizing Circle, from whoſe centre they ſhould all appear perfectly

perfectly equable: that is, they ſo adjuſted the velocities of theſe Spheres, as that, though the revolution of each of them would appear irregular when ſurveyed from its own centre, there ſhould, however, be a point comprehended within its circumference, from whence its motions ſhould appear to cut off, in equal times, equal portions of the Circle, of which that point was the centre.

Nothing can more evidently ſhow, how much the repoſe and tranquillity of the imagination is the ultimate end of philoſophy, than the invention of this Equalizing Circle. The motions of the heavenly bodies had appeared inconſtant and irregular, both in their velocities and in their directions. They were ſuch, therefore, as tended to embarraſs and confound the imagination, whenever it attempted to trace them. The invention of Eccentric Spheres, of Epicycles, and of the revolution of the centres of the Eccentric Spheres, tended to allay this confuſion, to connect together thoſe disjointed appearances, and to introduce harmony and order into the mind's conception of the movements of thoſe bodies. It did this, however, but imperfectly; it introduced uniformity and coherence into their real directions. But their velocities, when ſurveyed from the only point in which the velocity of what moves in a Circle can be truly judged of, the centre of that Circle, ſtill remained, in ſome meaſure, inconſtant as before; and ſtill, therefore, embarraſſed the imagination. The mind found itſelf ſomewhat relieved from this embarraſſment, when it conceived, that how irregular ſoever the motions of each of thoſe Circles might appear, when ſurveyed from its own centre, there was, however, in each of them, a point, from whence its revolution would appear perfectly equable and uniform, and ſuch as the imagination could eaſily follow. Thoſe philoſophers tranſported themſelves, in fancy, to the centres of theſe imaginary Circles, and took pleaſure in ſurveying from thence, all thoſe fantaſtical motions, arranged, according to that harmony and order, which it had been the end of all their reſearches

to beſtow upon them. Here, at laſt, they enjoyed that tranquillity and repoſe which they had purſued through all the mazes of this intricate hypotheſis; and here they beheld this, the moſt beautiful and magnificent part of the great theatre of nature, ſo diſpoſed and conſtructed, that they could attend, with eaſe and delight, to all the revolutions and changes that occurred in it.

Theſe, the Syſtem of Concentric, and that of Eccentric Spheres, ſeem to have been the two Syſtems of Aſtronomy, that had moſt credit and reputation with that part of the ancient world, who applied themſelves particularly to the ſtudy of the heavens. Cleanthes, however, and the other philoſophers of the Stoical ſect who came after him, appear to have had a ſyſtem of their own, quite different from either. But, though juſtly renowned for their ſkill in dialectic, and for the ſecurity and ſublimity of their moral doctrines, thoſe ſages ſeem never to have had any high reputation for their knowledge of the heavens; neither is the name of any one of them ever counted in the catalogue of the great aſtronomers, and ſtudious obſervers of the Stars, among the ancients. They rejected the doctrine of the Solid Spheres; and maintained, that the celeſtial regions were filled with a fluid ether, of too yielding a nature to carry along with it, by any motion of its own, bodies ſo immenſely great as the Sun, Moon, and Five Planets. Theſe, therefore, as well as the Fixed Stars, did not derive their motion from the circumambient body, but had each of them, in itſelf, and peculiar to itſelf, a vital principle of motion, which directed it to move with its own peculiar velocity, and its own peculiar direction. It was by this internal principle, that the Fixed Stars revolved directly from eaſt to weſt in circles parallel to the Equator, greater or leſs, according to their diſtance or nearneſs to the Poles, and with velocities ſo proportioned, that each of them finiſhed its diurnal period in the ſame time, in ſomething leſs than twenty-three hours and fifty-ſix minutes. It was, by a principle of the ſame kind, that

that the Sun moved weſtwards, for they allowed of no eaſtward motion in the heavens, but with leſs velocity than the Fixed Stars, ſo as to finiſh his diurnal period in twenty-four hours, and, conſequently, to fall every day behind them, by a ſpace of the heavens nearly equal to that which he paſſes over in four minutes; that is, nearly equal to a degree. This revolution of the Sun, too, was neither directly weſtwards, nor exactly circular; but after the Summer Solſtice, his motion began gradually to incline a little ſouthwards, appearing in his meridian to-day, further ſouth than yeſterday; and to-morrow ſtill further ſouth than to-day; and thus continuing every day to deſcribe a ſpiral line round the Earth, which carried him gradually further and further ſouthwards, till he arrived at the Winter Solſtice. Here, this ſpiral line began to change its direction, and to bring him gradually, every day, further and further northwards, till it again reſtored him to the Summer Solſtice. In the ſame manner they accounted for the motion of the Moon, and that of the Five Planets, by ſuppoſing that each of them revolved weſtwards, but with directions, and velocities, that were both different from one another, and continually varying; generally, however, in ſpherical lines, ſomewhat inclined to the Equator.

This ſyſtem ſeems never to have had the vogue. The ſyſtem of Concentric as well as that of Eccentric Spheres gives ſome ſort of reaſon, both for the conſtancy and equability of the motion of the Fixed Stars, and for the variety and uncertainty of that of the Planets. Each of them beſtow ſome ſort of coherence upon thoſe apparently disjointed phœnomena. But this other ſyſtem ſeems to leave them pretty much as it found them. Aſk a Stoic, why all the Fixed Stars perform their daily revolutions in circles parallel to each other, though of very different diameters, and with velocities ſo proportioned, that they all finiſh their period at the ſame time, and through the whole courſe of it preſerve the ſame diſtance and ſituation with

regard to one another? He can give no other anſwer, but that the peculiar nature, or if one may ſay ſo, the caprice of each Star directs it to move in that peculiar manner. His ſyſtem affords him no principle of connection, by which he can join together, in his imagination, ſo great a number of harmonious revolutions. But either of the other two ſyſtems, by the ſuppoſition of the ſolid firmament, affords this eaſily. He is equally at a loſs to connect together the peculiarities that are obſerved in the motions of the other heavenly bodies; the ſpiral motion of them all; their alternate progreſſion from north to ſouth, and from ſouth to north; the ſometimes accelerated, and again retarded motions of the Sun and Moon; the direct retrograde and ſtationary appearances of the Planets. All theſe have, in his ſyſtem, no bond of union, but remain as looſe and incoherent in the fancy, as they at firſt appeared to the ſenſes, before philoſophy had attempted, by giving them a new arrangement, by placing them at different diſtances, by aſſigning to each ſome peculiar but regular principle of motion, to methodize and diſpoſe them into an order that ſhould enable the imagination to paſs as ſmoothly, and with as little embarraſſment, along them, as along the moſt regular, familiar, and coherent appearances of nature.

Such were the ſyſtems of Aſtronomy that, in the ancient world, appear to have been adopted by any conſiderable party. Of all of them, the ſyſtem of Eccentric Spheres was that which correſponded moſt exactly with the appearances of the heavens. It was not invented till after thoſe appearances had been obſerved, with ſome accuracy, for more than a century together; and it was not completely digeſted by Ptolemy till the reign of Antoninus, after a much longer courſe of obſervations. We cannot wonder, therefore, that it was adapted to a much greater number of the phœnomena, than either of the other two ſyſtems, which had been formed before thoſe phœnomena were obſerved with any degree of attention, which, there-

fore, could connect them together only while they were thus regarded in the groſs, but which, it could not be expected, ſhould apply to them when they came to be conſidered in the detail. From the time of Hipparchus, therefore, this ſyſtem ſeems to have been pretty generally received by all thoſe who attended particularly to the ſtudy of the heavens. That aſtronomer firſt made a catalogue of the Fixed Stars; calculated, for ſix hundred years, the revolutions of the Sun, Moon, and Five Planets; marked the places in the heavens, in which, during all that period, each of thoſe bodies ſhould appear; aſcertained the times of the eclipſes of the Sun and Moon, and the particular places of the Earth in which they ſhould be viſible. His calculations were founded upon this ſyſtem, and as the events correſponded to his predictions, with a degree of accuracy which, though inferior to what Aſtronomy has ſince arrived at, was greatly ſuperior to any thing which the world had then known, they aſcertained, to all aſtronomers and mathematicians, the preference of his ſyſtem, above all thoſe which had been current before it.

It was, however, to aſtronomers and mathematicians only, that they aſcertained this; for, notwithſtanding the evident ſuperiority of this ſyſtem, to all thoſe with which the world was then acquainted, it was never adopted by any one ſect of philoſophers.

Philoſophers, long before the days of Hipparchus, ſeem to have abandoned the ſtudy of nature, to employ themſelves chiefly in ethical, rhetorical, and dialectical queſtions. Each party of them too, had by this time completed their peculiar ſyſtem or theory of the univerſe, and no human conſideration could then have induced them to give up any part of it. That ſupercilious and ignorant contempt too, with which at this time they regarded all mathematicians, among whom they counted aſtronomers, ſeems even to have hindered them from enquiring ſo far into their doctrines, as to know

what opinions they held. Neither Cicero nor Seneca, who have ſo often occaſion to mention the ancient ſyſtems of Aſtronomy, take any notice of that of Hipparchus. His name is not to be found in the writings of Seneca. It is mentioned but once in thoſe of Cicero, in a letter to Atticus, but without any note of approbation, as a geographer, and not as an aſtronomer. Plutarch, when he counts up, in his ſecond book, concerning the opinions of philoſophers, all the ancient ſyſtems of Aſtronomy, never mentions this, the only tolerable one which was known in his time. Thoſe three authors, it ſeems, converſed only with the writings of philoſophers. The elder Pliny indeed, a man whoſe curioſity extended itſelf equally to every part of learning, deſcribes the ſyſtem of Hipparchus, and never mentions its author, which he has occaſion to do often, without ſome note of that high admiration which he had ſo juſtly conceived for his merit. Such profound ignorance in thoſe profeſſed inſtructors of mankind, with regard to ſo important a part of the learning of their own times, is ſo very remarkable, that I thought it deſerved to be taken notice of, even in this ſhort account of the revolutions of philoſophy.

Syſtems in many reſpects reſemble machines. A machine is a little ſyſtem, created to perform, as well as to connect together, in reality, thoſe different movements and effects which the artiſt has occaſion for. A ſyſtem is an imaginary machine invented to connect together in the fancy thoſe different movements and effects which are already in reality performed. The machines that are firſt invented to perform any particular movement are always the moſt complex, and ſucceeding artiſts generally diſcover that, with fewer wheels, with fewer principles of motion, than had originally been employed, the ſame effects may be more eaſily produced. The firſt ſyſtems, in the ſame manner, are always the moſt complex, and a particular connecting chain, or principle, is generally thought neceſ-

ſary to unite every two ſeemingly diſjointed appearances: but it often happens, that one great connecting principle is afterwards found to be ſufficient to bind together all the diſcordant phœnomena that occur in a whole ſpecies of things. How many wheels are neceſſary to carry on the movements of this imaginary machine, the ſyſtem of Eccentric Spheres! The weſtward diurnal revolution of the Firmament, whoſe rapidity carries all the other heavenly bodies along with it, requires one. The periodical eaſtward revolutions of the Sun, Moon, and Five Planets, require, for each of thoſe bodies, another. Their differently accelerated and retarded motions require, that thoſe wheels, or circles, ſhould neither be concentric with the Firmament, nor with one another; which, more than any thing, ſeems to diſturb the harmony of the univerſe. The retrograde and ſtationary appearance of the Five Planets, as well as the extreme inconſtancy of the Moon's motion, require, for each of them, an Epicycle, another little wheel attached to the circumference of the great wheel, which ſtill more interrupts the uniformity of the ſyſtem. The motion of the apogeum of each of thoſe bodies requires, in each of them, ſtill another wheel, to carry the centres of their Eccentric Spheres round the centre of the Earth. And thus, this imaginary machine, though, perhaps, more ſimple, and certainly better adapted to the phœnomena than the Fifty-ſix Planetary Spheres of Ariſtotle, was ſtill too intricate and complex for the imagination to reſt in it with complete tranquillity and ſatisfaction.

It maintained its authority, however, without any diminution of reputation, as long as ſcience was at all regarded in the ancient world. After the reign of Antoninus, and, indeed, after the age of Hipparchus, who lived almoſt three hundred years before Antoninus, the great reputation which the earlier philoſophers had acquired, ſo impoſed upon the imaginations of mankind, that they ſeem to have deſpaired of ever equalling their renown. All human wiſdom, they

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ſuppoſed, was comprehended in the writings of thoſe elder ſages. To abridge, to explain, and to comment upon them, and thus ſhow themſelves, at leaſt, capable of underſtanding ſome of their ſublime myſteries, became now the only probable road to reputation. Proclus and Theon wrote commentaries upon the Syſtem of Ptolemy; but, to have attempted to invent a new one, would then have been regarded, not only as preſumption, but as impiety to the memory of their ſo much revered predeceſſors.

The ruin of the empire of the Romans, and, along with it, the ſubverſion of all law and order, which happened a few centuries afterwards, produced the entire neglect of that ſtudy of the connecting principles of nature, to which leiſure and ſecurity can alone give occaſion. After the fall of thoſe great conquerors and civilizers of mankind, the empire of the Califfs ſeems to have been the firſt ſtate under which the world enjoyed that degree of tranquillity which the cultivation of the ſciences requires. It was under the protection of thoſe generous and magnificent princes, that the ancient philoſophy and aſtronomy of the Greeks were reſtored and eſtabliſhed in the Eaſt; that tranquillity, which their mild, juſt, and religious government diffuſed over their vaſt empire, revived the curioſity of mankind, to inquire into the connecting principles of nature. The fame of the Greek and Roman learning, which was then recent in the memories of men, made them deſire to know, concerning theſe abſtruſe ſubjects, what were the doctrines of the ſo much renowned ſages of thoſe two nations.

They tranſlated, therefore, into the Arabian language, and ſtudied, with great eagerneſs, the works of many Greek philoſophers, particularly of Ariſtotle, Ptolemy, Hippocrates, and Galen. The ſuperiority which they eaſily diſcovered in them, above the rude eſſays which their own nation had yet had time to produce, and which were

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ſuch, we may ſuppoſe, as ariſe every where in the firſt infancy of ſcience, neceſſarily determined them to embrace their ſyſtems, particularly that of Aſtronomy: neither were they ever afterwards able to throw off their authority. For, though the munificence of the Abaſſides, the ſecond race of the Califfs, is ſaid to have ſupplied the Arabian aſtronomers with larger and better inſtruments, than any that were known to Ptolemy and Hipparchus, the ſtudy of the ſciences ſeems, in that mighty empire, to have been either of too ſhort, or too interrupted a continuance, to allow them to make any conſiderable correction in the doctrines of thoſe old mathematicians. The imaginations of mankind had not yet got time to grow ſo familiar with the ancient ſyſtems, as to regard them without ſome degree of that aſtoniſhment which their grandeur and novelty excited; a novelty of a peculiar kind, which had at once the grace of what was new, and the authority of what was ancient. They were ſtill, therefore, too much enſlaved to thoſe ſyſtems, to dare to depart from them, when thoſe confuſions which ſhook, and at laſt overturned the peaceful throne of the Califfs, baniſhed the ſtudy of the ſciences from that empire. They had, however, before this, made ſome conſiderable improvements: they had meaſured the obliquity of the Ecliptic, with more accuracy than had been done before. The tables of Ptolemy had, by the length of time, and by the inaccuracy of the obſervations upon which they were founded, become altogether wide of what was the real ſituation of the heavenly bodies, as he himſelf indeed had foretold they would do. It became neceſſary, therefore, to form new ones, which was accordingly executed by the orders of the Califf Almamon, under whom, too, was made the firſt menſuration of the Earth that we know of, after the commencement of the Chriſtian Æra, by two Arabian aſtronomers, who, in the plain of Sennaar, meaſured two degrees of its circumference.

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The victorious arms of the Saracens carried into Spain the learning, as well as the gallantry, of the Eaſt; and along with it, the tables of Almamon, and the Arabian tranſlations of Ptolemy and Ariſtotle; and thus Europe received a ſecond time, from Babylon, the rudiments of the ſcience of the heavens. The writings of Ptolemy were tranſlated from Arabic into Latin; and the Peripatetic philoſophy was ſtudied in Averroes and Avicenna with as much eagerneſs, and with as much ſubmiſſion to its doctrines in the Weſt, as it had been in the Eaſt.

The doctrine of the Solid Spheres had, originally, been invented, in order to give a phyſical account of the revolutions of the heavenly bodies, according to the ſyſtem of Concentric Circles, to which that doctrine was very eaſily accommodated. Thoſe mathematicians who invented the doctrine of Eccentric Circles and Epicycles, contented themſelves with ſhowing, how, by ſuppoſing the heavenly bodies to revolve in ſuch orbits, the phœnomena might be connected together, and ſome ſort of uniformity and coherence be beſtowed upon their real motions. The phyſical cauſes of thoſe motions they left to the conſideration of the philoſophers; though, as appears from ſome paſſages of Ptolemy, they had ſome general apprehenſion, that they were to be explained by a like hypotheſis. But, though the ſyſtem of Hipparchus was adopted by all aſtronomers and mathematicians, it never was received, as we have already obſerved, by any one ſect of philoſophers among the ancients. No attempt, therefore, ſeems to have been made amongſt them, to accommodate to it any ſuch hypotheſis.

The ſchoolmen, who received, at once, from the Arabians, the philoſophy of Ariſtotle, and the aſtronomy of Hipparchus, were neceſſarily obliged to reconcile them to one another, and to connect together

together the revolutions of the Eccentric Circles and Epicycles of the one, by the ſolid Spheres of the other. Many different attempts of this kind were made by many different philoſophers: but, of them all, that of Purbach, in the fifteenth century, was the happieſt and the moſt eſteemed. Though his hypotheſis is the ſimpleſt of any of them, it would be in vain to deſcribe it without a ſcheme; neither is it eaſily intelligible with one: for, if the ſyſtem of Eccentric Circles and Epicycles was before too perplexed and intricate for the imagination to reſt in it, with complete tranquillity and ſatisfaction, it became much more ſo, when this addition had been made to it. The world, juſtly indeed, applauded the ingenuity of that philoſopher, who could unite, ſo happily, two ſuch ſeemingly inconſiſtent ſyſtems. His labours, however, ſeem rather to have increaſed than to have diminiſhed the cauſes of that diſſatisfaction, which the learned ſoon began to feel with the ſyſtem of Ptolemy. He, as well as all thoſe who had worked upon the ſame plan before him, by rendering this account of things more complex, rendered it ſtill more embarraſſing than it had been before.

Neither was the complexneſs of this ſyſtem the ſole cauſe of the diſſatisfaction, which the world in general began, ſoon after the days of Purbach, to expreſs for it. The tables of Ptolemy having, upon account of the inaccuracy of the obſervations on which they were founded, become altogether wide of the real ſituation of the heavenly bodies, thoſe of Almamon, in the ninth century, were, upon the ſame hypotheſis, compoſed to correct their deviations. Theſe again, a few ages afterwards, became, for the ſame reaſon, equally uſeleſs. In the thirteenth century, Alphonſus, the philoſophical king of Caſtile, found it neceſſary to give orders for the compoſition of thoſe tables, which bear his name. It is he, who is ſo well known for the whimſical impiety of uſing to ſay, that, had he been conſulted at the creation of the univerſe, he could have given good ad-

vice; an apophthegm which is ſuppoſed to have proceeded from his diſlike to the intricate ſyſtem of Ptolemy. In the fifteenth century, the deviation of the Alphonſine tables began to be as ſenſible, as thoſe of Ptolemy and Almamon had been before. It appeared evident, therefore, that, though the ſyſtem of Ptolemy might, in the main, be true, certain corrections were neceſſary to be made in it before it could be brought to correſpond with exact preciſion to the phœnomena. For the revolution of his Eccentric Circles and Epicycles, ſuppoſing them to exiſt, could not, it was evident, be preciſely ſuch as he repreſented them; ſince the revolutions of the heavenly bodies deviated, in a ſhort time, ſo widely from what the moſt exact calculations, that were founded upon his hypotheſis, repreſented them. It had plainly, therefore, become neceſſary to correct, by more accurate obſervations, both the velocities and directions of all the wheels and circles of which his hypotheſis is compoſed. This, accordingly, was begun by Purbach, and carried on by Regiomontanus, the diſciple, the continuator, and the perfecter of the ſyſtem of Purbach; and one, whoſe untimely death, amidſt innumerable projects for the recovery of old, and the invention and advancement of new ſciences, is, even at this day, to be regretted.

When you have convinced the world, that an eſtabliſhed ſyſtem ought to be corrected, it is not very difficult to perſuade them that it ſhould be deſtroyed. Not long, therefore, after the death of Regiomontanus, Copernicus began to meditate a new ſyſtem, which ſhould connect together the celeſtial appearances, in a more ſimple as well as a more accurate manner, than that of Ptolemy.

The confuſion, in which the old hypotheſis repreſented the motions of the heavenly bodies, was, he tells us, what firſt ſuggeſted to him the deſign of forming a new ſyſtem, that theſe, the nobleſt works of nature, might no longer appear devoid of that harmony and proportion which diſcover themſelves in her meaneſt productions.

tions. What moſt of all diſſatisfied him, was, the notion of the Equalizing Circle, which, by repreſenting the revolutions of the Celeſtial Spheres, as equable only, when ſurveyed from a point that was different from their centers, introduced a real inequality into their motions; contrary to that moſt natural, and indeed fundamental idea, with which all the authors of aſtronomical ſyſtems, Plato, Eudoxus, Ariſtotle, even Hipparchus and Ptolemy themſelves, had hitherto ſet out, that the real motions of ſuch beautiful and divine objects muſt neceſſarily be perfectly regular, and go on, in a manner, as agreeable to the imagination, as the objects themſelves are to the ſenſes. He began to conſider, therefore, whether, by ſuppoſing the heavenly bodies to be arranged in a different order from that in which Ariſtotle and Hipparchus had placed them, this ſo much ſought for uniformity might not be beſtowed upon their motions. To diſcover this arrangement, he examined all the obſcure traditions delivered down to us, concerning every other hypotheſis which the ancients had invented, for the ſame purpoſe. He found, in Plutarch, that ſome old Pythagoreans had repreſented the Earth as revolving in the centre of the univerſe, like a wheel round its own axis; and that others, of the ſame ſect, had removed it from the centre, and repreſented it as revolving in the Ecliptic like a ſtar round the central fire. By this central fire, he ſuppoſed they meant the Sun; and though in this he was very widely miſtaken, it was, it ſeems, upon this interpretation, that he began to conſider how ſuch an hypotheſis might be made to correſpond to the appearances. The ſuppoſed authority of thoſe old philoſophers, if it did not originally ſuggeſt to him his ſyſtem, ſeems, at leaſt, to have confirmed him in an opinion, which, it is not improbable, that he had before-hand other reaſons for embracing, notwithſtanding what he himſelf would affirm to the contrary.

It then occurred to him, that, if the Earth was ſuppoſed to revolve every day round its axis, from weſt to eaſt, all the heavenly bodies

would appear to revolve, in a contrary direction, from eaſt to weſt. The diurnal revolution of the heavens, upon this hypotheſis, might be only apparent; the firmament, which has no other ſenſible motion, might be perfectly at reſt; while the Sun, the Moon, and the Five Planets, might have no other movement beſide that eaſtward revolution, which is peculiar to themſelves. That, by ſuppoſing the Earth to revolve with the Planets, round the Sun, in an orbit, which comprehended within it the orbits of Venus and Mercury, but was comprehended within thoſe of Mars, Jupiter, and Saturn, he could, without the embarraſſment of Epicycles, connect together the apparent annual revolutions of the Sun, and the direct, retrograde, and ſtationary appearances of the Planets: that while the Earth really revolved round the Sun on one ſide of the heavens, the Sun would appear to revolve round the Earth on the other; that while ſhe really advanced in her annual courſe, he would appear to advance eaſtward in that movement which is peculiar to himſelf. That, by ſuppoſing the axis of the Earth to be always parallel to itſelf, not to be quite perpendicular, but ſomewhat inclined to the plane of her orbit, and conſequently to preſent to the Sun, the one pole when on the one ſide of him, and the other when on the other, he would account for the obliquity of the Ecliptic; the Sun's ſeemingly alternate progreſſion from north to ſouth, and from ſouth to north, the conſequent change of the ſeaſons, and different lengths of days and nights in the different ſeaſons.

If this new hypotheſis thus connected together all theſe appearances as happily as that of Ptolemy, there were others which it connected together much better. The three ſuperior Planets, when nearly in conjunction with the Sun, appear always at the greateſt diſtance from the Earth, are ſmalleſt, and leaſt ſenſible to the eye, and ſeem to revolve forward in their direct motion with the greateſt rapidity. On the contrary, when in oppoſition to the Sun, that is, when in their meridian about midnight, they appear neareſt the Earth,

Earth, are largeſt, and moſt ſenſible to the eye, and ſeem to revolve backwards in their retrograde motion. To explain theſe appearances, the ſyſtem of Ptolemy ſuppoſed each of theſe Planets to be at the upper part of their ſeveral Epicycles, in the one caſe; and at the lower, in the other. But it afforded no ſatisfactory principle of connection, which could lead the mind eaſily to conceive how the Epicycles of thoſe Planets, whoſe ſpheres were ſo diſtant from the ſphere of the Sun, ſhould thus, if one may ſay ſo, keep time to his motion. The ſyſtem of Copernicus afforded this eaſily, and like a more ſimple machine, without the aſſiſtance of Epicycles, connected together, by fewer movements, the complex appearances of the heavens. When the ſuperior Planets appear nearly in conjunction with the Sun, they are then in the ſide of their orbits, which is almoſt oppoſite to, and moſt diſtant from the Earth, and therefore appear ſmalleſt, and leaſt ſenſible to the eye. But, as they then revolve in a direction which is almoſt contrary to that of the Earth, they appear to advance forward with double velocity; as a ſhip, that ſails in a contrary direction to another, appears from that other, to ſail both with its own velocity, and the velocity of that from which it is ſeen. On the contrary, when thoſe Planets are in oppoſition to the Sun, they are on the ſame ſide of the Sun with the Earth, are neareſt it, moſt ſenſible to the eye, and revolve in the ſame direction with it; but, as their revolutions round the Sun are ſlower than that of the Earth, they are neceſſarily left behind by it, and therefore ſeem to revolve backwards; as a ſhip which ſails ſlower than another, though it ſails in the ſame direction, appears from that other to ſail backwards. After the ſame manner, by the ſame annual revolution of the Earth, he connected together the direct and retrograde motions of the two inferior Planets, as well as the ſtationary appearances of all the Five.

There are ſome other particular phœnomena of the two inferior Planets, which correſpond ſtill better to this ſyſtem, and ſtill worſe

to

to that of Ptolemy. Venus and Mercury ſeem to attend conſtantly upon the motion of the Sun, appearing, ſometimes on the one ſide, and ſometimes on the other, of that great luminary; Mercury being almoſt always buried in his rays, and Venus never receding above forty-eight degrees from him, contrary to what is obſerved in the other three Planets, which are often ſeen in the oppoſite ſide of the heavens, at the greateſt poſſible diſtance from the Sun. The ſyſtem of Ptolemy accounted for this, by ſuppoſing that the centers of the Epicycles of theſe two Planets were always in the ſame line with thoſe of the Sun and the Earth; that they appeared therefore in conjunction with the Sun, when either in the upper or lower part of their Epicycles, and at the greateſt diſtance from him, when in the ſides of them. It aſſigned, however, no reaſon why the Epicycles of theſe two Planets ſhould obſerve ſo different a rule from that which takes place in thoſe of the other three, nor for the enormous Epicycle of Venus, whoſe ſides muſt have been forty-eight degrees diſtant from the Sun, while its center was in conjunction with him, and whoſe diameter muſt have covered more than a quadrant of the Great Circle. But how eaſily all theſe appearances coincide with the hypotheſis, which repreſents thoſe two inferior Planets revolving round the Sun in orbits comprehended within the orbit of the Earth, is too obvious to require an explanation.

Thus far did this new account of things render the appearances of the heavens more completely coherent than had been done by any of the former ſyſtems. It did this, too, by a more ſimple and intelligible, as well as more beautiful machinery. It repreſented the Sun, the great enlightener of the univerſe, whoſe body was alone larger than all the Planets taken together, as eſtabliſhed immoveable in the center, ſhedding light and heat on all the worlds that circulated around him in one uniform direction, but in longer or ſhorter periods, according to their different diſtances. It took away the diurnal revolution of the firmament, whoſe rapidity, upon the old hy-

potheſis, was beyond what even thought could conceive. It not only delivered the imagination from the embarraſſment of Epicycles, but from the difficulty of conceiving theſe two oppoſite motions going on at the ſame time, which the ſyſtem of Ptolemy and Ariſtotle beſtowed upon all the Planets; I mean, their diurnal weſtward, and periodical eaſtward revolutions. The Earth's revolution round its own axis took away the neceſſity for ſuppoſing the firſt, and the ſecond was eaſily conceived when by itſelf. The Five Planets, which ſeem, upon all other ſyſtems, to be objects of a ſpecies by themſelves, unlike to every thing to which the imagination has been accuſtomed, when ſuppoſed to revolve along with the Earth round the Sun, were naturally apprehended to be objects of the ſame kind with the Earth, habitable, opaque, and enlightened only by the rays of the Sun. And thus this hypotheſis, by claſſing them in the ſame ſpecies of things, with an object that is of all others the moſt familiar to us, took off that wonder and uncertainty which the ſtrangeneſs and ſingularity of their appearance had excited; and thus far, too, better anſwered the great end of Philoſophy.

Neither did the beauty and ſimplicity of this ſyſtem alone recommend it to the imagination; the novelty and unexpectedneſs of that view of nature, which it opened to the fancy, excited more wonder and ſurpriſe than the ſtrangeſt of thoſe appearances, which it had been invented to render natural and familiar, and theſe ſentiments ſtill more endeared it. For, though it is the end of Philoſophy, to allay that wonder, which either the unuſual or ſeemingly diſjointed appearances of nature excite, yet ſhe never triumphs ſo much, as when, in order to connect together a few, in themſelves, perhaps, inconſiderable objects, ſhe has, if I may ſay ſo, created another conſtitution of things, more natural indeed, and ſuch as the imagination can more eaſily attend to, but more new, more contrary to common opinion

opinion and expectation, than any of thoſe appearances themſelves. As, in the inſtance before us, in order to connect together ſome ſeeming irregularities in the motions of the Planets, the moſt inconſiderable objects in the heavens, and of which the greater part of mankind have no occaſion to take any notice during the whole courſe of their lives, ſhe has, to talk in the hyperbolical language of Tycho-Brache, moved the Earth from its foundations, ſtopt the revolution of the Firmament, made the Sun ſtand ſtill, and ſubverted the whole order of the Univerſe.

Such were the advantages of this new hypotheſis, as they appeared to its author, when he firſt invented it. But, though that love of paradox, ſo natural to the learned, and that pleaſure, which they are ſo apt to take in exciting, by the novelty of their ſuppoſed diſcoveries, the amazement of mankind, may, notwithſtanding what one of his diſciples tells us to the contrary, have had its weight in prompting Copernicus to adopt this ſyſtem; yet, when he had completed his Treatiſe of Revolutions, and began coolly to conſider what a ſtrange doctrine he was about to offer to the world, he ſo much dreaded the prejudice of mankind againſt it, that, by a ſpecies of continence, of all others the moſt difficult to a philoſopher, he detained it in his cloſet for thirty years together. At laſt, in the extremity of old age, he allowed it to be extorted from him, but died as ſoon as it was printed, and before it was publiſhed.

When it appeared in the world, it was almoſt univerſally diſapproved of, by the learned as well as by the ignorant. The natural prejudices of ſenſe, confirmed by education, prevailed too much with both, to allow them to give it a fair examination. A few diſciples only, whom he himſelf had inſtructed in his doctrine, received it with eſteem and admiration. One of them, Reinholdus, formed, upon this hypotheſis, larger and more accurate aſtronomical tables,

than what accompanied the Treatiſe of Revolutions, in which Copernicus had been guilty of ſome errors in calculation. It ſoon appeared, that theſe Prutenic Tables, as they were called, correſponded more exactly with the heavens, than the Tables of Alphonſus. This ought naturally to have formed a prejudice in favour of the diligence and accuracy of Copernicus in obſerving the heavens. But it ought to have formed none in favour of his hypotheſis; ſince the ſame obſervations, and the reſult of the ſame calculations, might have been accommodated to the ſyſtem of Ptolemy, without making any greater alteration in that ſyſtem than what Ptolemy had foreſeen, and had even foretold ſhould be made. It formed, however, a prejudice in favour of both, and the learned began to examine, with ſome attention, an hypotheſis which afforded the eaſieſt methods of calculation, and upon which the moſt exact predictions had been made. The ſuperior degree of coherence, which it beſtowed upon the celeſtial appearances, the ſimplicity and uniformity which it introduced into the real directions and velocities of the Planets, ſoon diſpoſed many aſtronomers, firſt to favour, and at laſt to embrace a ſyſtem, which thus connected together ſo happily, the moſt disjointed of thoſe objects that chiefly occupied their thoughts. Nor can any thing more evidently demonſtrate, how eaſily the learned give up the evidence of their ſenſes to preſerve the coherence of the ideas of their imagination, than the readineſs with which this, the moſt violent paradox in all philoſophy, was adopted by many ingenious aſtronomers, notwithſtanding its inconſiſtency with every ſiſtem of phyſics then known in the world, and notwithſtanding the great number of other more real objections, to which, as Copernicus left it, this account of things was moſt juſtly expoſed.

It was adopted, however, nor can this be wondered at, by aſtronomers only. The learned in all other ſciences, continued to regard it with the ſame contempt as the vulgar. Even aſtronomers were di-

vided about its merit; and many of them rejected a doctrine, which not only contradicted the eſtabliſhed ſyſtem of Natural Philoſophy, but which, conſidered aſtronomically only, ſeemed to labour under ſeveral difficulties.

Some of the objections againſt the motion of the Earth, that were drawn from the prejudices of ſenſe, the patrons of this ſyſtem, indeed, eaſily enough, got over. They repreſented, that the Earth might really be in motion, though, to its inhabitants, it ſeemed to be at reſt; and that the Sun, and Fixed Stars, might really be at reſt, though from the Earth they ſeemed to be in motion; in the ſame manner as a ſhip, which ſails through a ſmooth ſea, ſeems to thoſe who are in it, to be at reſt, though really in motion; while the objects which ſhe paſſes along, ſeem to be in motion, though really at reſt.

But there were ſome other objections, which, though grounded upon the ſame natural prejudices, they found it more difficult to get over. The Earth had always preſented itſelf to the ſenſes, not only as at reſt, but as inert, ponderous, and even averſe to motion. The imagination had always been accuſtomed to conceive it as ſuch, and ſuffered the greateſt violence, when obliged to purſue, and attend it, in that rapid motion which the ſyſtem of Copernicus beſtowed upon it. To enforce their objection, the adverſaries of this hypotheſis were at pains to calculate the extreme rapidity of this motion. They repreſented, that the circumference of the Earth had been computed to be above twenty-three thouſand miles: if the Earth, therefore, was ſuppoſed to revolve every day round its axis, every point of it near the equator would paſs over above twenty-three thouſand miles in a day; and conſequently, near a thouſand miles in an hour, and about ſixteen miles in a minute; a motion more rapid than that of a cannon ball, or even than the ſwifter progreſs of ſound. The rapi-

pidity of its periodical revolution was yet more violent than that of its diurnal rotation. How, therefore, could the imagination ever conceive ſo ponderous a body to be naturally endowed with ſo dreadful a movement? The Peripatetic Philoſophy, the only philoſophy then known in the world, ſtill further confirmed this prejudice. That philoſophy, by a very natural, though, perhaps, groundleſs diſtinction, divided all motion into Natural and Violent. Natural motion was that which flowed from an innate tendency in the body, as when a ſtone fell downwards: Violent motion, that which aroſe from external force, and which was, in ſome meaſure, contrary to the natural tendency of the body, as when a ſtone was thrown upwards, or horizontally. No violent motion could be laſting; for, being conſtantly weakened by the natural tendency of the body, it would ſoon be deſtroyed. The natural motion of the Earth, as was evident in all its parts, was downwards, in a ſtrait line to the center; as that of fire and air was upwards, in a ſtrait line from the center. It was the heavens only that revolved naturally in a circle. Neither, therefore, the ſuppoſed revolution of the Earth round its own center, nor that round the Sun, could be natural motions; they muſt therefore be violent, and conſequently could be of no long continuance. It was in vain that Copernicus replied, that gravity was, probably, nothing elſe beſides a tendency in the different parts of the ſame Planet, to unite themſelves to one another; that this tendency took place, probably, in the parts of the other Planets, as well as in thoſe of the Earth; that it could very well be united with a circular motion; that it might be equally natural to the whole body of the Planet, and to every part of it; that his adverſaries themſelves allowed, that a circular motion was natural to the heavens, whoſe diurnal revolution was infinitely more rapid than even that motion which he had beſtowed upon the Earth; that though a like motion was natural to the Earth, it would ſtill appear to be at reſt to its inhabitants, and all the parts of it to tend in a ſtrait line to the center, in the ſame manner

as at preſent. But this anſwer, how ſatisfactory ſoever it may appear to be now, neither did nor could appear to be ſatisfactory then. By admitting the diſtinction betwixt natural and violent motions, it was founded upon the ſame ignorance of mechanical principles with the objection. The ſyſtems of Ariſtotle and Hipparchus ſuppoſed, indeed, the diurnal motion of the heavenly bodies to be infinitely more rapid than even that dreadful movement which Copernicus beſtowed upon the Earth. But they ſuppoſed, at the ſame time, that thoſe bodies were objects of a quite different ſpecies, from any we are acquainted with, near the ſurface of the Earth, and to which, therefore, it was leſs difficult to conceive that any ſort of motion might be natural. Thoſe objects, beſides, had never preſented themſelves to the ſenſes, as moving otherwiſe, or with leſs rapidity, than theſe ſyſtems repreſented them. The imagination, therefore, could feel no difficulty in following a repreſentation which the ſenſes had rendered quite familiar to it. But when the Planets came to be regarded as ſo many Earths, the caſe was quite altered. The imagination had been accuſtomed to conceive ſuch objects as tending rather to reſt than motion; and this idea of their natural inertneſs, encumbered, if one may ſay ſo, and clogged its flight, whenever it endeavoured to purſue them in their periodical courſes, and to conceive them as continually ruſhing through the celeſtial ſpaces, with ſuch violent and unremitting rapidity.

Nor were the firſt followers of Copernicus more fortunate in their anſwers to ſome other objections, which were founded indeed in the ſame ignorance of the laws of motion, but which, at the ſame time, were neceſſarily connected with that way of conceiving things, which then prevailed univerſally in the learned world.

If the Earth, it was ſaid, revolved ſo rapidly from weſt to eaſt, a perpetual wind would ſet in from eaſt to weſt, more violent than what blows

blows in the greateſt hurricanes; a ſtone, thrown weſtwards, would fly to a much greater diſtance than one thrown with the ſame force eaſtwards; as what moved in a direction, contrary to the motion of the Earth, would neceſſarily paſs over a greater portion of its ſurface, than what, with the ſame velocity, moved along with it. A ball, it was ſaid, dropt from the maſt of a ſhip under ſail, does not fall preciſely at the foot of the maſt, but behind it; and in the ſame manner, a ſtone dropt from a high tower would not, upon the ſuppoſition of the Earth's motion, fall preciſely at the bottom of the tower, but weſt of it, the Earth being, in the mean time, carried away eaſtward from below it. It is amuſing to obſerve, by what ſubtile and metaphyſical evaſions the followers of Copernicus endeavoured to elude this objection, which, before the doctrine of the Compoſition of Motion had been explained by Galileo, was altogether unanſwerable. They allowed, that a ball dropt from the maſt of a ſhip under ſail would not fall at the foot of the maſt, but behind it; becauſe the ball, they ſaid, was no part of the ſhip, and becauſe the motion of the ſhip was natural neither to itſelf nor to the ball. But the ſtone was a part of the earth, and the diurnal and annual revolutions of the Earth were natural to the whole, and to every part of it, and therefore to the ſtone. The ſtone, therefore, having naturally the ſame motion with the Earth, fell preciſely at the bottom of the tower. But this anſwer could not ſatisfy the imagination, which ſtill found it difficult to conceive how theſe motions could be natural to the Earth; or how a body, which had always preſented itſelf to the ſenſes as inert, ponderous, and averſe to motion, ſhould naturally be continually wheeling about both its own axis and the Sun, with ſuch violent rapidity. It was, beſides, argued by Tycho Brache, upon the principles of the ſame philoſophy, which had afforded both the objection and the anſwer, that even upon the ſuppoſition, that any ſuch motion was natural to the whole body of the Earth, yet the ſtone, which was ſeparated from it, could no longer

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be actuated by that motion. The limb, which is cut off from an animal, loſes thoſe animal motions which were natural to the whole. The branch, which is cut off from the trunk, loſes that vegetative motion which is natural to the whole tree. Even the metals, minerals, and ſtones, which are dug out from the boſom of the Earth, loſe thoſe motions which occaſioned their production and encreaſe, and which were natural to them in their original ſtate. Though the diurnal and annual motion of the Earth, therefore, had been natural to them while they were contained in its boſom; it could no longer be ſo when they were ſeparated from it.

Tycho Brache, the great reſtorer of the ſcience of the heavens, who had ſpent his life, and waſted his fortune upon the advancement of Aſtronomy, whoſe obſervations were both more numerous and more accurate than thoſe of all the aſtronomers who had gone before him, was himſelf ſo much affected by the force of this objection, that, though he never mentioned the ſyſtem of Copernicus without ſome note of the high admiration he had conceived for its author, he could never himſelf be induced to embrace it: yet all his aſtronomical obſervations tended to confirm it. They demonſtrated, that Venus and Mercury were ſometimes above, and ſometimes below the Sun; and that, conſequently, the Sun, and not the Earth, was the center of their periodical revolutions. They ſhowed, that Mars, when in his meridian at midnight, was nearer to the Earth than the Earth is to the Sun; though, when in conjunction with the Sun, he was much more remote from the Earth than that luminary; a diſcovery which was abſolutely inconſiſtent with the ſyſtem of Ptolemy, which proved, that the Sun, and not the Earth, was the center of the periodical revolutions of Mars, as well as of Venus and Mercury; and which demonſtrated, that the Earth was placed betwixt the orbits of Mars and Venus. They made the ſame thing probable with regard to Jupiter and Saturn; that they, too, revolved round the Sun;

and

and that, therefore, the Sun, if not the center of the univerſe, was at leaſt, that of the planetary ſyſtem. They proved, that Comets were ſuperior to the Moon, and moved through the heavens in all poſſible directions; an obſervation incompatible with the Solid Spheres of Ariſtotle and Purbach, and which, therefore, overturned the phyſical part, at leaſt, of the eſtabliſhed Aſtronomy.

All theſe obſervations, joined to his averſion to the ſyſtem, and perhaps, notwithſtanding the generoſity of his character, ſome little jealouſy of the fame of Copernicus, ſuggeſted to Tycho the idea of a new hypotheſis, in which the Earth continued to be, as in the old account, the immoveable center of the univerſe, round which the firmament revolved every day from eaſt to weſt, and, by ſome ſecret virtue, carried the Sun, the Moon, and the Five Planets along with it, notwithſtanding their immenſe diſtance, and notwithſtanding that there was nothing betwixt it and them but the moſt fluid ether. But, although all theſe ſeven bodies thus obeyed the diurnal revolution of the Firmament, they had each of them, as in the old ſyſtem, too, a contrary periodical eaſtward revolution of their own, which made them appear to be every day, more or leſs, left behind by the Firmament. The Sun was the center of the periodical revolutions of the Five Planets; the Earth, that of the Sun and Moon. The Five Planets followed the Sun in his periodical revolution round the Earth, as they did the Firmament in its diurnal rotation. The three ſuperior Planets comprehended the Earth within the orbit in which they revolved round the Sun, and had each of them an Epicycle to connect together, in the ſame manner as in the ſyſtem of Ptolemy, their direct, retrograde, and ſtationary appearances. As, notwithſtanding their immenſe diſtance, they followed the Sun in his periodical revolution round the Earth, keeping always at an equal diſtance from him, they were neceſſarily brought much nearer to the Earth when in oppoſition to the Sun, than when in conjunction with him. Mars,

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the neareſt of them, when in his meridian at midnight, came within the orbit which the Sun deſcribed round the Earth, and conſequently was then nearer to the Earth than the Earth was to the Sun. The appearances of the two inferior Planets were explained, in the ſame manner, as in the ſyſtem of Copernicus, and conſequently required no Epicycle to connect them. The circles in which the Five Planets performed their periodical revolutions round the Sun, as well as thoſe in which the Sun and Moon performed theirs round the Earth, were, as both in the old and new hypotheſis, Eccentric Circles, to connect together their differently accelerated and retarded motions.

Such was the ſyſtem of Tycho Brache, compounded, as is evident, out of theſe of Ptolemy and Copernicus; happier than that of Ptolemy, in the account which it gives of the motions of the two inferior Planets; more complex, by ſuppoſing the different revolutions of all the Five to be performed round two different centers; the diurnal round the Earth, the periodical round the Sun; but, in every reſpect, more complex and more incoherent than that of Copernicus. Such, however, was the difficulty that mankind felt in conceiving the motion of the Earth, that it long balanced the reputation of that otherwiſe more beautiful ſyſtem. It may be ſaid, that thoſe who conſidered the heavens only, favoured the ſyſtem of Copernicus, which connected ſo happily all the appearances which preſented themſelves there. But that thoſe who looked upon the Earth, adopted the account of Tycho Brache, which, leaving it at reſt in the center of the univerſe, did leſs violence to the uſual habits of the imagination. The learned were, indeed, ſenſible of the intricacy, and of the many incoherences of that ſyſtem; that it gave no account why the Sun, Moon, and Five Planets, ſhould follow the revolution of the Firmament; or why the Five Planets, notwithſtanding the immenſe diſtance of the three ſuperior ones, ſhould obey the periodical motion of the Sun; or why the Earth, though placed between

tween the orbits of Mars and Venus, ſhould remain immoveable in the center of the Firmament, and conſtantly reſiſt the influence of whatever it was, which carried bodies that were ſo much larger than itſelf, and that were placed on all ſides of it, periodically round the Sun. Tycho Brahe died before he had fully explained his ſyſtem. His great and merited renown diſpoſed many of the learned to believe, that, had his life been longer, he would have connected together many of theſe incoherences, and knew methods of adapting his ſyſtem to ſome other appearances, with which none of his followers could connect it.

The objection to the ſyſtem of Copernicus, which was drawn from the nature of motion, and that was moſt inſiſted on by Tycho Brahe, was at laſt fully anſwered by Galileo; not, however, till about thirty years after the death of Tycho, and about a hundred after that of Copernicus. It was then that Galileo, by explaining the nature of the compoſition of motion, by ſhowing, both from reaſon and experience, that a ball dropt from the maſt of a ſhip under ſail would fall preciſely at the foot of the maſt, and by rendering this doctrine, from a great number of other inſtances, quite familiar to the imagination, took off, perhaps, the principal objection which had been made to this hypotheſis.

Several other aſtronomical difficulties, which encumbered this account of things, were removed by the ſame philoſopher. Copernicus, after altering the center of the world, and making the Earth, and all the Planets revolve round the Sun, was obliged to leave the Moon to revolve round the Earth as before. But no example of any ſuch ſecondary Planet having then been diſcovered in the heavens, there ſeemed ſtill to be this irregularity remaining in the ſyſtem. Galileo, who firſt applied teleſcopes to Aſtronomy, diſcovered, by their aſſiſtance, the Satellites of Jupiter, which, revolving round

that Planet, at the ſame time that they were carried along with it in its revolution, round either the Earth, or the Sun, made it ſeem leſs contrary to the analogy of nature, that the Moon ſhould both revolve round the Earth, and accompany her in her revolution round the Sun.

It had been objected to Copernicus, that, if Venus and Mercury revolved round the Sun, in an orbit comprehended within the orbit of the Earth, they would ſhow all the ſame phaſes with the Moon, preſent, ſometimes their darkened, and ſometimes their enlightened ſides to the Earth, and ſometimes part of the one, and part of the other. He anſwered, that they undoubtedly did all this; but that their ſmallneſs and diſtance hindered us from perceiving it. This very bold aſſertion of Copernicus was confirmed by Galileo. His teleſcopes rendered the phaſes of Venus quite ſenſible, and thus demonſtrated, more evidently than had been done, even by the obſervations of Tycho Brahe, the revolutions of theſe two Planets round the Sun, as well as ſo far deſtroyed the ſyſtem of Ptolemy.

The mountains and ſeas, which, by the help of the ſame inſtrument, he diſcovered, or imagined he had diſcovered in the Moon, rendering that Planet, in every reſpect, ſimilar to the Earth, made it ſeem leſs contrary to the analogy of nature, that, as the Moon revolved round the Earth, the Earth ſhould revolve round the Sun.

The ſpots which, in the ſame manner, he diſcovered in the Sun, demonſtrating, by their motion, the revolution of the Sun round his axis, made it ſeem leſs improbable that the Earth, a body ſo much ſmaller than the Sun, ſhould revolve round her axis in the ſame manner.

Succeeding

Succeeding teleſcopical obſervations, diſcovered, in each of the Five Planets, ſpots not unlike thoſe which Galileo had obſerved in the Moon, and thereby ſeemed to demonſtrate what Copernicus had only conjectured, that the Planets were naturally opaque, enlightened only by the rays of the Sun, habitable, diverſified by ſeas and mountains, and, in every reſpect, bodies of the ſame kind with the Earth; and thus added one other probability to this ſyſtem. By diſcovering, too, that each of the Planets revolved round its own axis, at the ſame time that it was carried round either the Earth or the Sun, they made it ſeem quite agreeable to the analogy of nature, that the Earth, which, in every other reſpect, reſembled the Planets, ſhould, like them too, revolve round its own axis, and at the ſame time perform its periodical motion round the Sun.

While, in Italy, the unfortunate Galileo was adding ſo many probabilities to the ſyſtem of Copernicus, there was another philoſopher employing himſelf in Germany, to aſcertain, correct, and improve it. Kepler, with great genius, but without the taſte, or the order and method of Galileo, poſſeſſed, like all his other countrymen, the moſt laborious induſtry, joined to that paſſion for diſcovering proportions and reſemblances betwixt the different parts of nature, which, though common to all philoſophers, ſeems, in him, to have been exceſſive. He had been inſtructed, by Mæſtlinus, in the ſyſtem of Copernicus; and his firſt curioſity was, as he tells us, to find out, why the Planets, the Earth being counted for one, were Six in number; why they were placed at ſuch irregular diſtances from the Sun; and whether there was any uniform proportion betwixt their ſeveral diſtances, and the times employed in their periodical revolutions. Till ſome reaſon, or proportion of this kind, could be diſcovered, the ſyſtem did not appear to him to be completely coherent. He endeavoured, firſt, to find it in the proportions of numbers, and plain figures; afterwards, in thoſe of the regular ſolids; and, laſt of all, in thoſe of the

muſical diviſions of the Octave. Whatever was the ſcience which Kepler was ſtudying, he ſeems conſtantly to have pleaſed himſelf with finding ſome analogy betwixt it and the ſyſtem of the univerſe; and thus, arithmetic and muſic, plain and ſolid geometry, came all of them by turns to illuſtrate the doctrine of the Sphere, in the explaining of which he was, by his profeſſion, principally employed. Tycho Brahe, to whom he had preſented one of his books, though he could not but diſapprove of his ſyſtem, was pleaſed, however, with his genius, and with his indefatigable diligence in making the moſt laborious calculations. That generous and magnificent Dane invited the obſcure and indigent Kepler to come and live with him, and communicated to him, as ſoon as he arrived, his obſervations upon Mars, in the arranging and methodizing of which his diſciples were at that time employed. Kepler, upon comparing them with one another, found, that the orbit of Mars was not a perfect circle; that one of its diameters was ſomewhat longer than the other; and that it approached to an oval, or an ellipſe, which had the Sun placed in one of its foci. He found, too, that the motion of the Planet was not equable; that it was ſwifteſt when neareſt the Sun, and ſloweſt when furtheſt from him; and that its velocity gradually encreaſed, or diminiſhed, according as it approached or receded from him. The obſervations of the ſame aſtronomer diſcovered to him, though not ſo evidently, that the ſame things were true of all the other Planets; that their orbits were elliptical, and that their motions were ſwifteſt when neareſt the Sun, and ſloweſt when furtheſt from him. They ſhowed the ſame things, too, of the Sun, if ſuppoſed to revolve round the Earth; and conſequently of the Earth, if ſuppoſed to revolve round the Sun.

That the motions of all the heavenly bodies were perfectly circular, had been the fundamental idea, upon which every aſtronomical hypotheſis, except the irregular one of the Stoics, had been built.

A circle,

A circle, as the degree of its curvature is every where the ſame, is of all curve lines the ſimpleſt and the moſt eaſily conceived. Since it was evident, therefore, that the heavenly bodies did not move in ſtrait lines, the indolent imagination found, that it could moſt eaſily attend to their motions if they were ſuppoſed to revolve in perfect circles. It had, upon this account, determined that a circular motion was the moſt perfect of all motions, and that none but the moſt perfect motion could be worthy of ſuch beautiful and divine objects; and it had upon this account, ſo often, in vain, endeavoured to adjuſt to the appearances, ſo many different ſyſtems, which all ſuppoſed them to revolve in this manner.

The equality of their motions was another fundamental idea, which, in the ſame manner, and for the ſame reaſon, was ſuppoſed by all the founders of aſtronomical ſyſtems. For an equal motion can be more eaſily attended to, than one that is continually either accelerated or retarded. All inconſtancy, therefore, was declared to be unworthy thoſe bodies which revolved in the celeſtial regions, and to be fit only for inferior and ſublunary things. The calculations of Kepler overturned, with regard to the Planets, both theſe natural prejudices of the imagination; deſtroyed their circular orbits; and introduced into their real motions, ſuch an inequality as no equalizing circle would remedy. It was, however, to render their motions perfectly equable, without even the aſſiſtance of an equalizing circle, that Copernicus, as he himſelf aſſures us, had originally invented his ſyſtem. Since the calculations of Kepler, therefore, overturned what Copernicus had principally in view in eſtabliſhing his ſyſtem, we cannot wonder that they ſhould at firſt ſeem rather to embarraſs than improve it.

It is true, by theſe elliptical orbits and unequal motions, Kepler diſengaged the ſyſtem from the embarraſſment of thoſe ſmall Epicycles,

cycles, which Copernicus, in order to connect the ſeemingly accelerated and retarded movements of the Planets with their ſuppoſed real equality, had been obliged to leave in it. For it is remarkable, that though Copernicus had delivered the orbits of the Planets from the enormous Epicycles of Hipparchus, that though in this conſiſted the great ſuperiority of his ſyſtem above that of the ancient aſtronomers, he was yet obliged, himſelf, to abandon, in ſome meaſure, this advantage, and to make uſe of ſome ſmall Epicycles, to join together thoſe ſeeming irregularities. His Epicycles indeed, like the irregularities for whoſe ſake they were introduced, were but ſmall ones, and the imaginations of his firſt followers ſeem, accordingly, either to have ſlurred them over altogether, or ſcarcely to have obſerved them. Neither Galileo, nor Gaſſendi, the two moſt eloquent of his defenders, take any notice of them. Nor does it ſeem to have been generally attended to, that there was any ſuch thing as Epicycles in the ſyſtem of Copernicus, till Kepler, in order to vindicate his own elliptical orbits, inſiſted, that even, according to Copernicus, the body of the Planet was to be found but at two different places in the circumference of that circle which the center of its Epicycle deſcribed.

It is true, too, that an ellipſe is, of all curve lines after a circle, the ſimpleſt and moſt eaſily conceived; and it is true, beſides all this, that, while Kepler took from the motion of the Planets the eaſieſt of all proportions, that of equality, he did not leave them abſolutely without one, but aſcertained the rule by which their velocities continually varied; for a genius ſo fond of analogies, when he had taken away one, would be ſure to ſubſtitute another in its room. Notwithſtanding all this, notwithſtanding that his ſyſtem was better ſupported by obſervations than any ſyſtem had ever been before, yet, ſuch was the attachment to the equal motions and circular orbits of the Planets, that it ſeems, for ſome time, to have been in general but

little attended to by the learned, to have been altogether neglected by philoſophers, and not much regarded even by aſtronomers.

Gaſſendi, who began to figure in the world about the latter days of Kepler, and who was himſelf no mean aſtronomer, ſeems indeed to have conceived a good deal of eſteem for his diligence and accuracy in accommodating the obſervations of Tycho Brahe to the ſyſtem of Copernicus. But Gaſſendi appears to have had no comprehenſion of the importance of thoſe alterations which Kepler had made in that ſyſtem, as is evident from his ſcarcely ever mentioning them in the whole courſe of his voluminous writings upon Aſtronomy. Des Cartes, the cotemporary and rival of Gaſſendi, ſeems to have paid no attention to them at all, but to have built his Theory of the Heavens, without any regard to them. Even thoſe aſtronomers, whom a ſerious attention had convinced of the juſtneſs of his corrections, were ſtill ſo enamoured with the circular orbits and equal motions, that they endeavoured to compound his ſyſtem with thoſe ancient, but natural prejudices. Thus, Ward endeavoured to ſhow that, though the Planets moved in elliptical orbits, which had the Sun in one of their foci, and though their velocities in the elliptical line were continually varying, yet, if a ray was ſuppoſed to be extended from the center of any one of them to the other focus, and to be carried along by the periodical motion of the Planet, it would make equal angles in equal times, and conſequently cut off equal portions of the circle of which that other focus was the center. To one, therefore, placed in that focus, the motion of the Planet would appear to be perfectly circular and perfectly equable, in the ſame manner as in the Equalizing Circles of Ptolemy and Hipparchus. Thus Bouillaud, who cenſured this hypotheſis of Ward, invented another of the ſame kind, infinitely more whimſical and capricious. The Planets, according to that aſtronomer, always revolve in circles; for that being the moſt perfect figure, it is impoſſible they ſhould revolve in

in any other. No one of them, however, continues to move in any one circle, but is perpetually paſſing from one to another, through an infinite number of circles, in the courſe of each revolution; for an ellipſe, ſaid he, is an oblique ſection of a cone, and in a cone, betwixt the two vortices of the ellipſe there is an infinite number of circles, out of the infinitely ſmall portions of which the elliptical line is compounded. The Planet, therefore, which moves in this line, is, in every point of it, moving in an infinitely ſmall portion of a certain circle. The motion of each Planet, too, according to him, was neceſſarily, for the ſame reaſon, perfectly equable. An equable motion being the moſt perfect of all motions. It was not, however, in the elliptical line, that it was equable, but in any one of the circles that were parallel to the baſe of that cone, by whoſe ſection this elliptical line had been formed: for, if a ray was extended from the Planet to any one of thoſe circles, and carried along by its periodical motion, it would cut off equal portions of that circle in equal times; another moſt fantaſtical equalizing circle, ſupported by no other foundation beſides the frivolous connection betwixt a cone and an ellipſe, and recommended by nothing but the natural paſſion for circular orbits and equable motions. It may be regarded as the laſt effort of this paſſion, and many ſerve to ſhow the force of that principle which could thus oblige this accurate obſerver, and great improver of the Theory of the Heavens, to adopt ſo ſtrange an hypotheſis. Such was the difficulty and heſitation with which the followers of Copernicus adopted the corrections of Kepler.

The rule, indeed, which Kepler aſcertained for determining the gradual acceleration or retardation in the movement of the Planets, was intricate, and difficult to be comprehended; it could therefore but little facilitate the progreſs of the imagination in tracing thoſe revolutions which were ſuppoſed to be conducted by it. According to that aſtronomer, if a ſtrait line was drawn from the center of each

each Planet to the Sun, and carried along by the periodical motion of the Planet, it would deſcribe equal areas in equal times, though the Planet did not paſs over equal ſpaces; and the ſame rule, he found, took place nearly with regard to the Moon. The imagination, when acquainted with the law by which any motion is accelerated or retarded, can follow and attend to it more eaſily, than when at a loſs, and, as it were, wandering in uncertainty with regard to the proportion which regulates its varieties; the diſcovery of this analogy therefore, no doubt, rendered the ſyſtem of Kepler more agreeable to the natural taſte of mankind: it was, however, an analogy too difficult to be followed, or comprehended, to render it completely ſo.

Kepler, beſides this, introduced another new analogy into the ſyſtem, and firſt diſcovered, that there was one uniform relation obſerved betwixt the diſtances of the Planets from the Sun, and the times employed in their periodical motions. He found, that their periodical times were greater than in proportion to their diſtances, and leſs than in proportion to the ſquares of thoſe diſtances; but, that they were nearly as the mean proportionals betwixt their diſtances and the ſquares of their diſtances; or, in other words, that the ſquares of their periodical times were nearly as the cubes of their diſtances; an analogy, which, though, like all others, it no doubt rendered the ſyſtem ſomewhat more diſtinct and comprehenſible, was, however, as well as the former, of too intricate a nature to facilitate very much the effort of the imagination in conceiving it.

The truth of both theſe analogies, intricate as they were, was at laſt fully eſtabliſhed by the obſervations of Caſſini. That aſtronomer firſt diſcovered, that the ſecondary Planets of Jupiter and Saturn revolved round their primary ones, according to the ſame laws which

Kepler had obſerved in the revolutions of the primary ones round the Sun, and that of the Moon round the earth; that each of them deſcribed equal areas in equal times, and that the ſquares of their periodic times were as the cubes of their diſtances. When theſe two laſt abſtruſe analogies, which, when Kepler at firſt obſerved them, were but little regarded, had been thus found to take place in the revolutions of the Four Satellites of Jupiter, and in thoſe of the Five of Saturn, they were now thought not only to confirm the doctrine of Kepler, but to add a new probability to the Copernican hypotheſis. The obſervations of Caſſini ſeem to eſtabliſh it as a law of the ſyſtem, that, when one body revolved round another, it deſcribed equal areas in equal times; and that, when ſeveral revolved round the ſame body, the ſquares of their periodic times were as the cubes of their diſtances. If the Earth and the Five Planets were ſuppoſed to revolve round the Sun, theſe laws, it was ſaid, would take place univerſally. But if, according to the ſyſtem of Ptolemy, the Sun, Moon, and Five Planets were ſuppoſed to revolve round the Earth, the periodical motions of the Sun and Moon would, indeed, obſerve the firſt of theſe laws, would each of them deſcribe equal areas in equal times; but they would not obſerve the ſecond, the ſquares of their periodic times would not be as the cubes of their diſtances: and the revolutions of the Five Planets would obſerve neither the one law nor the other. Or if, according to the ſyſtem of Tycho Brahe, the Five Planets were ſuppoſed to revolve round the Sun, while the Sun and Moon revolved round the Earth, the revolutions of the Five Planets round the Sun, would, indeed, obſerve both theſe laws; but thoſe of the Sun and Moon round the Earth would obſerve only the firſt of them. The analogy of nature, therefore, could be preſerved completely, according to no other ſyſtem but that of Copernicus, which, upon that account, muſt be the true one. This argument is regarded by Voltaire, and the Cardinal of Polignac, as an irrefragable demonſtration; even Mc Laurin, who

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was more capable of judging; nay, Newton himſelf, ſeems to mention it as one of the principal evidences for the truth of that hypotheſis. Yet, an analogy of this kind, it would ſeem, far from a demonſtration, could afford, at moſt, but the ſhadow of a probability.

It is true, that though Caſſini ſuppoſed the Planets to revolve in an oblong curve, it was in a curve ſomewhat different from that of Kepler. In the ellipſe the ſum of the two lines, which are drawn from any one point in the circumference to the two foci, is always equal to that of thoſe which are drawn from any other point in the circumference to the ſame foci. In the curve of Caſſini, it is not the ſum of the lines, but the rectangles which are contained under the lines, that are always equal. As this, however, was a proportion more difficult to be comprehended than the other, the curve of Caſſini has never had the vogue.

Nothing now embarraſſed the ſyſtem of Corpernicus, but the difficulty which the imagination felt in conceiving bodies ſo immenſely ponderous as the Earth, and the other Planets, revolving round the Sun with ſuch incredible rapidity. It was in vain that Copernicus pretended, that, notwithſtanding the prejudices of ſenſe, this circular motion might be as natural to the Planets, as it is to a ſtone to fall to the ground. The imagination had been accuſtomed to conceive ſuch objects as tending rather to reſt than motion. This habitual idea of their natural inertneſs was incompatible with that of their natural motion. It was in vain that Kepler, in order to aſſiſt the fancy in connecting together this natural inertneſs with their aſtoniſhing velocities, talked of ſome vital and immaterial virtue, which was ſhed by the Sun into the ſurrounding ſpaces, which was whirled about with his revolution round his own axis, and which, taking hold of the Planets, forced them, in ſpite of their ponde-

roulneſs and ſtrong propenſity to reſt, thus to whirl about the center of the ſyſtem. The imagination had no hold of this immaterial virtue, and could form no determinate idea of what it conſiſted in. The imagination, indeed, felt a gap, or interval, betwixt the conſtant motion and the ſuppoſed inertneſs of the Planets, and had in this, as in all other caſes, ſome general idea or apprehenſion that there muſt be a connecting chain of intermediate objects to link together theſe diſcordant qualities. Wherein this connecting chain conſiſted, it was, indeed, at a loſs to conceive; nor did the doctrine of Kepler lend it any aſſiſtance in this reſpect. That doctrine, like almoſt all thoſe of the philoſophy in faſhion during his time, beſtowed a name upon this inviſible chain, called it an immaterial virtue, but afforded no determinate idea of what was its nature.

Des Cartes was the firſt who attempted to aſcertain, preciſely, wherein this inviſible chain conſiſted, and to afford the imagination a train of intermediate events, which, ſucceeding each other in an order that was of all others the moſt familiar to it, ſhould unite thoſe incoherent qualities, the rapid motion, and the natural inertneſs of the Planets. Des Cartes was the firſt who explained wherein conſiſted the real inertneſs of matter; that it was not in an averſion to motion, or in a propenſity to reſt, but in a power of continuing indifferently either at reſt or in motion, and of reſiſting, with a certain force, whatever endeavoured to change its ſtate from the one to the other. According to that ingenious and fanciful philoſopher, the whole of infinite ſpace was full of matter, for with him matter and extenſion were the ſame, and conſequently there could be no void. This immenſity of matter, he ſuppoſed, to be divided into an infinite number of very ſmall cubes; all of which, being whirled about upon their own centers, neceſſarily gave occaſion to the production of two different elements. The firſt conſiſted of thoſe angular parts, which, having been neceſſarily rubbed off, and grinded

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yet ſmaller by their mutual friction, conſtituted the moſt ſubtile and moveable part of matter. The ſecond conſiſted of thoſe little globules that were formed by the rubbing off of the firſt. The interſtices betwixt theſe globules of the ſecond element was filled up by the particles of the firſt. But in the infinite colliſions, which muſt occur in an infinite ſpace filled with matter, and all in motion, it muſt neceſſarily happen, that many of the globules of the ſecond element ſhould be broken and grinded down into the firſt. The quantity of the firſt element having thus been encreaſed beyond what was ſufficient to fill up the interſtices of the ſecond, it muſt, in many places, have been heaped up together, without any mixture of the ſecond along with it. Such, according to Des Cartes, was the original diviſion of matter. Upon this infinitude of matter thus divided, a certain quantity of motion was originally impreſſed by the Creator of all things, and the laws of motion were ſo adjuſted as always to preſerve the ſame quantity in it, without increaſe, and without diminution. Whatever motion was loſt by one part of matter, was communicated to ſome other; and whatever was acquired by one part of matter, was derived from ſome other: and thus, through an eternal revolution, from reſt to motion, and from motion to reſt, in every part of the univerſe, the quantity of motion in the whole was always the ſame.

But, as there was no void, no one part of matter could be moved without thruſting ſome other out of its place, nor that without thruſting ſome other, and ſo on. To avoid, therefore, an infinite progreſs, he ſuppoſed, that the matter which any body puſhed before it, rolled immediately backwards, to ſupply the place of that matter which flowed in behind it; as we may obſerve in the ſwimming of a fiſh, that the water, which it puſhes before it, immediately rolls backwards, to ſupply the place of what flows in behind it, and thus forms a ſmall circle or vortex round the body of the fiſh. It

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was, in the ſame manner, that the motion originally impreſſed by the Creator upon the infinitude of matter, neceſſarily produced in it an infinity of greater and ſmaller vortices, or circular ſtreams: and the law of motion being ſo adjuſted as always to preſerve the ſame quantity of motion in the univerſe, thoſe vortices either continued for ever, or by their diſſolution give birth to others of the ſame kind. There was, thus, at all times, an infinite number of greater and ſmaller vortices, or circular ſtreams, revolving in the univerſe.

But, whatever moves in a circle, is conſtantly endeavouring to fly off from the center of its revolution. For the natural motion of all bodies is in a ſtraight line. All the particles of matter, therefore, in each of thoſe greater vortices, were continually preſſing from the center to the circumference, with more or leſs force, according to the different degrees of their bulk and ſolidity. The larger and more ſolid globules of the ſecond element forced themſelves upwards to the circumference, while the ſmaller, more yielding, and more active particles of the firſt, which could flow, even through the interſtices of the ſecond, were forced downwards to the center. They were forced downwards to the center, notwithſtanding their natural tendency was upwards to the circumference; for the ſame reaſon that a piece of wood, when plunged in water, is forced upwards to the ſurface, notwithſtanding its natural tendency is downwards to the bottom; becauſe its tendency downwards is leſs ſtrong than that of the particles of water, which, therefore, if one may ſay ſo, preſs in before it, and thus force it upwards. But there being a greater quantity of the firſt element than what was neceſſary to fill up the interſtices of the ſecond, it was neceſſarily accumulated in the center of each of theſe great circular ſtreams, and formed there the firey and active ſubſtance of the Sun. For, according to that philoſopher, the Solar Syſtems were infinite in number, each Fixed Star being the center of one: and he is among the firſt of the moderns, who thus took

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away the boundaries of the Univerſe; even Copernicus and Kepler, themſelves, having confined it within, what they ſuppoſed, the vault of the Firmament.

The center of each vortex being thus occupied by the moſt active and moveable parts of matter, there was neceſſarily among them, a more violent agitation than in any other part of the vortex, and this violent agitation of the center cheriſhed and ſupported the movement of the whole. But, among the particles of the firſt element, which fill up the interſtices of the ſecond, there are many, which, from the preſſure of the globules on all ſides of them, neceſſarily receive an angular form, and thus conſtitute a third element of particles leſs fit for motion than thoſe of the other two. As the particles, however, of this third element were formed in the interſtices of the ſecond, they are neceſſarily ſmaller than thoſe of the ſecond, and are, therefore, along with thoſe of the firſt, urged down towards the center, where, when a number of them happen to take hold of one another, they form ſuch ſpots upon the ſurface of the accumulated particles of the firſt element, as are often diſcovered by teleſcopes upon the face of that Sun, which enlightens and animates our particular ſyſtem. Thoſe ſpots are often broken and diſpelled, by the violent agitation of the particles of the firſt element, as has hitherto happily been the caſe with thoſe which have ſucceſſively been formed upon the face of our Sun. Sometimes, however, they encruſt the whole ſurface of that fire which is accumulated in the center; and the communication betwixt the moſt active and the moſt inert parts of the vortex being thus interrupted, the rapidity of its motion immediately begins to languiſh, and can no longer defend it from being ſwallowed up and carried away by the ſuperior violence of ſome other like circular ſtream; and in this manner, what was once a Sun, becomes a Planet. Thus, the time was, according to this ſyſtem, when the Moon was a body of the ſame kind with the Sun, the firey center of a circular

cular ſtream of ether, which flowed continually round her; but her face having been cruſted over by a congeries of angular particles, the motion of this circular ſtream began to languiſh, and could no longer defend itſelf from being abſorbed by the more violent vortex of the Earth, which was then, too, a Sun, and which chanced to be placed in its neighbourhood. The Moon, therefore, became a Planet, and revolved round the Earth. In proceſs of time, the ſame fortune, which had thus befallen the Moon, befell alſo the Earth; its face was encruſted by a groſs and inactive ſubſtance; the motion of its vortex began to languiſh, and it was abſorbed by the greater vortex of the Sun: but though the vortex of the Earth had thus become languid, it ſtill had force enough to occaſion both the diurnal revolution of the Earth, and the monthly motion of the Moon. For a ſmall circular ſtream may eaſily be conceived as flowing round the body of the Earth, at the ſame time that it is carried along by that great ocean of ether which is continually revolving round the Sun; in the ſame manner, as in a great whirlpool of water, one may often ſee ſeveral ſmall whirlpools, which revolve round centers of their own, and at the ſame time are carried round the center of the great one. Such was the cauſe of the original formation and conſequent motions of the Planetary Syſtem. When a ſolid body is turned round its center, thoſe parts of it, which are neareſt, and thoſe which are remoteſt from the center, complete their revolutions in one and the ſame time. But it is otherwiſe with the revolutions of a fluid: the parts of it which are neareſt the center complete their revolutions in a ſhorter time, than thoſe which are remoter. The Planets, therefore, all floating in that immenſe tide of ether which is continually ſetting in from weſt to eaſt round the body of the Sun, complete their revolutions in a longer or a ſhorter time, according to their nearneſs or diſtance from him. There was, however, according to Des Cartes, no very exact proportion obſerved betwixt the times of their revolutions and their diſtances from the center. For that nice

analogy, which Kepler had diſcovered betwixt them, having not yet been confirmed by the obſervations of Caſſini, was, as I before took notice, entirely diſregarded by Des Cartes. According to him, too, their orbits might not be perfectly circular, but be longer the one way than the other, and thus approach to an Ellipſe. Nor yet was it neceſſary to ſuppoſe, that they deſcribed this figure with geometrical accuracy, or even that they deſcribed always preciſely the ſame figure. It rarely happens, that nature can be mathematically exact with regard to the figure of the objects ſhe produces, upon account of the infinite combinations of impulſes, which muſt conſpire to the production of each of her effects. No two Planets, no two animals of the ſame kind, have exactly the ſame figure, nor is that of any one of them perfectly regular. It was in vain, therefore, that aſtronomers laboured to find that perfect conſtancy and regularity in the motions of the heavenly bodies, which is to be found in no other parts of nature. Theſe motions, like all others, muſt either languiſh or be accelerated, according as the cauſe which produces them, the revolution of the vortex of the Sun, either languiſhes, or is accelerated; and there are innumerable events which may occaſion either the one or the other of thoſe changes.

It was thus, that Des Cartes endeavoured to render familiar to the imagination, the greateſt difficulty in the Copernican ſyſtem, the rapid motion of the enormous bodies of the Planets. When the fancy had thus been taught to conceive them as floating in an immenſe ocean of ether, it was quite agreeable to its uſual habits to conceive, that they ſhould follow the ſtream of this ocean, how rapid ſoever. This was an order of ſucceſſion to which it had been long accuſtomed, and with which it was, therefore, quite familiar. This account, too, of the motions of the Heavens, was connected with a vaſt, an immenſe ſyſtem, which joined together a greater number of the moſt diſcordant phænomena of nature, than had

been united by any other hypotheſis; a ſyſtem in which the principles of connection, though perhaps equally imaginary, were, however, more diſtinct and determinate, than any that had been known before; and which attempted to trace to the imagination, not only the order of ſucceſſion by which the heavenly bodies were moved, but that by which they, and almoſt all other natural objects, had originally been produced.—The Carteſian philoſophy begins now to be almoſt univerſally rejected, while the Copernican ſyſtem continues to be univerſally received. Yet, it is not eaſy to imagine, how much probability and coherence this admired ſyſtem was long ſuppoſed to derive from that exploded hypotheſis. Des Cartes had publiſhed his principles, the disjointed and incoherent ſyſtem of Tycho Brahe, though it was embraced heartily and completely by ſcarce any body, was yet conſtantly talked of by all the learned, as, in point of probability, upon a level with that of Copernicus. They took notice, indeed, of its inferiority with regard to coherence and connection, expreſſing hopes, however, that theſe defects might be remedied by ſome future improvements. But when the world beheld that complete, and almoſt perfect coherence, which the philoſophy of Des Cartes beſtowed upon the ſyſtem of Copernicus, the imaginations of mankind could no longer refuſe themſelves the pleaſure of going along with ſo harmonious an account of things. The ſyſtem of Tycho Brahe was every day leſs and leſs talked of, till at laſt it was forgotten altogether.

The ſyſtem of Des Cartes, however, though it connected together the real motions of the heavenly bodies according to the ſyſtem of Copernicus, more happily than had been done before, did ſo only when they were conſidered in the groſs; but did not apply to them, when they were regarded in the detail. Des Cartes, as was ſaid before, had never himſelf obſerved the Heavens with any particular application. Though he was not ignorant, therefore, of any of the obſervations which had been made

made before his time, he ſeems to have paid them no great degree of attention; which, probably, proceeded from his own inexperience in the ſtudy of Aſtronomy. So far, therefore, from accommodating his ſyſtem to all the minute irregularities, which Kepler had aſcertained in the movements of the Planets; or from ſhewing, particularly, how theſe irregularities, and no other, ſhould ariſe from it, he contented himſelf with obſerving, that perfect uniformity could not be expected in their motions, from the nature of the cauſes which produced them; that certain irregularities might take place in them, for a great number of ſucceſſive revolutions, and afterwards give way to others of a different kind: a remark which, happily, relieved him from the neceſſity of applying his ſyſtem to the obſervations of Kepler, and the other Aſtronomers.

But when the obſervations of Caſſini had eſtabliſhed the authority of thoſe laws, which Kepler had firſt diſcovered in the ſyſtem, the philoſophy of Des Cartes, which could afford no reaſon, why ſuch particular laws ſhould be obſerved, might continue to amuſe the learned in other ſciences, but could no longer ſatisfy thoſe that were ſkilled in Aſtronomy. Sir Iſaac Newton firſt attempted to give a phyſical account of the motions of the Planets, which ſhould accommodate itſelf to all the conſtant irregularities which aſtronomers had ever obſerved in their motions. The phyſical connection, by which Des Cartes had endeavoured to bind together the movements of the Planets, was the laws of impulſe; of all the orders of ſucceſſion, thoſe which are moſt familiar to the imagination; as they all flow from the inertneſs of matter. After this quality, there is no other, with which we are ſo well acquainted, as that of gravity. We never act upon matter, but we have occaſion to obſerve it. The ſuperior genius and ſagacity of Sir Iſaac Newton, therefore, made the moſt happy, and, we may now ſay, the greateſt and moſt admirable improvement that was ever made in philoſophy, when he

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diſcovered, that he could join together the movements of the Planets by ſo familiar a principle of connection, which completely removed all the difficulties the imagination had hitherto felt in attending to them. He demonſtrated, that, if the Planets were ſuppoſed to gravitate towards the Sun, and to one another, and at the ſame time to have had a projecting force originally impreſſed upon them, the primary ones might all deſcribe ellipſes in one of the foci of which that great luminary was placed; and the ſecondary ones might deſcribe figures of the ſame kind round their reſpective primaries, without being diſturbed by the continual motion of the centers of their revolutions. That if the force, which retained each of them in their orbits, was like that of gravity, and directed towards the Sun, they would, each of them, deſcribe equal areas in equal times. That if this attractive power of the Sun, like all other qualities which are diffuſed in rays from a center, diminiſhed in the ſame proportion as the ſquares of the diſtances increaſed, their motions would be ſwifteſt when neareſt the Sun, and ſloweſt when fartheſt off from him, in the ſame proportion in which, by obſervation, they are diſcovered to be; and that, upon the ſame ſuppoſition, of this gradual diminution of their reſpective gravities, their periodic times would bear the ſame proportion to their diſtances, which Kepler and Caſſini had eſtabliſhed betwixt them. Having thus ſhown, that gravity might be the connecting principle which joined together the movements of the Planets, he endeavoured next to prove that it really was ſo. Experience ſhews us, what is the power of gravity near the ſurface of the Earth. That it is ſuch as to make a body fall, in the firſt ſecond of its deſcent, through about fifteen Pariſian feet. The Moon is about ſixty ſemidiameters of the Earth diſtant from its ſurface. If gravity, therefore, was ſuppoſed to diminiſh, as the ſquares of the diſtance increaſe, a body, at the Moon, would fall towards the Earth in a minute; that is, in ſixty ſeconds, through the ſame ſpace, which it falls near its ſurface in one ſecond. But the arch which the

Moon

Moon deſcribes in a minute, falls, by obſervation, about fifteen Pariſian feet below the tangent drawn at the beginning of it. So far, therefore, the Moon may be conceived as conſtantly falling towards the Earth.

The ſyſtem of Sir Iſaac Newton correſponded to many other irregularities which Aſtronomers had obſerved in the Heavens. It aſſigned a reaſon, why the centers of the revolutions of the Planets were not preciſely in the center of the Sun, but in the common center of gravity of the Sun and the Planets. From the mutual attraction of the Planets, it gave a reaſon for ſome other irregularities in their motions; irregularities, which are quite ſenſible in thoſe of Jupiter and Saturn, when thoſe Planets are nearly in conjunction with one another. But of all the irregularities in the Heavens, thoſe of the Moon had hitherto given the greateſt perplexity to Aſtronomers; and the ſyſtem of Sir Iſaac Newton correſponded, if poſſible, yet more accurately with them than with any of the other Planets. The Moon, when either in conjunction, or in oppoſition to the Sun, appears furtheſt from the Earth, and neareſt to it when in her quarters. According to the ſyſtem of that philoſopher, when ſhe is in conjunction with the Sun, ſhe is nearer the Sun than the Earth is; conſequently, more attracted to him, and, therefore, more ſeparated from the Earth. On the contrary, when in oppoſition to the Sun, ſhe is further from the Sun than the Earth. The Earth, therefore, is more attracted to the Sun; and, conſequently, in this caſe, too, further ſeparated from the Moon. But, on the other hand, when the Moon is in her quarters, the Earth and the Moon, being both at equal diſtance from the Sun, are equally attracted to him. They would not, upon this account alone, therefore, be brought nearer to one another. As it is not in parallel lines, however, that they are attracted towards the Sun, but in lines which meet in his center, they are, thereby, ſtill further approached to one another.

Sir

Sir Iſaac Newton computed the difference of the forces, with which the Moon and the Earth ought, in all thoſe different ſituations, according to his theory, to be impelled towards one another; and found, that the different degrees of their approaches, as they had been obſerved by Aſtronomers, correſponded exactly to his computations. As the attraction of the Sun, in the conjunctions and oppoſitions, diminiſhes the gravity of the Moon towards the Earth, and, conſequently, makes her neceſſarily extend her orbit, and, therefore, require a longer periodical time to finiſh it. But, when the Moon and the Earth are in that part of the orbit which is neareſt the Sun, this attraction of the Sun will be the greateſt; conſequently, the gravity of the Moon towards the Earth, will there be moſt diminiſhed; her orbit be moſt extended; and her periodic time be, therefore, the longeſt. This is, alſo, agreeable to experience, and in the very ſame proportion, in which, by computation, from theſe principles, it might be expected.

The orbit of the Moon is not precisely in the ſame Plane with that of the Earth; but makes a very ſmall angle with it. The points of interſection of thoſe two Planes, are called, the Nodes of the Moon. Theſe Nodes of the Moon are in continual motion, and in eighteen or nineteen years, revolve backwards, from eaſt to weſt, through all the different points of the Ecliptic. For the Moon, after having finiſhed her periodical revolution, generally interſects the orbit of the Earth ſomewhat behind the point where ſhe had interſected it before. But, though the motion of the Nodes is thus generally retrograde, it is not always ſo, but is ſometimes direct, and ſometimes they appear even ſtationary; the Moon generally interſects the Plane of the Earth's orbit, behind the point where ſhe had interſected it in her former revolution; but ſhe ſometimes interſects it before that point, and ſometimes in the very ſame point. It is the ſituation of thoſe Nodes which determines the times of Eclipſes, and their motions had, upon this account, at all times, been particularly attended to by Aſtro-

nomers. Nothing, however, has perplexed them more, than to account for theſe ſo inconſiſtent motions, and, at the ſame time, preſerve their ſo much ſought-for regularity in the revolutions of the Moon. For they had no other means of connecting the appearances together, than by ſuppoſing the motions which produced them, to be, in reality, perfectly regular and equable. The hiſtory of Aſtronomy, therefore, gives an account of a greater number of theories invented for connecting together the motions of the Moon, than for connecting together thoſe of all the other heavenly bodies taken together. The theory of gravity, connected together, in the moſt accurate manner, by the different actions of the Sun and the Earth, all thoſe irregular motions; and it appears, by calculation, that the time, the quantity, and the duration of thoſe direct and retrograde motions of the Nodes, as well as of their ſtationary appearances, might be expected to be exactly ſuch, as the obſervations of Aſtronomers have determined them.

The ſame principle, the attraction of the Sun, which thus accounts for the motions of the Nodes, connects, too, another very perplexing irregularity in the appearances of the Moon; the perpetual variation in the inclination of her orbit to that of the Earth.

As the Moon revolves in an ellipſe, which has the centre of the Earth in one of its foci, the longer axis of its orbit is called the Line of its Apſides. This line is found, by obſervation, not to be always directed towards the ſame points of the Firmament, but to revolve forwards, from weſt to eaſt, ſo as to paſs through all the points of the Ecliptic, and to complete its period in about nine years; another irregularity, which had very much perplexed Aſtronomers, but which the theory of gravity ſufficiently accounted for.

The

The Earth had hitherto been regarded as perfectly globular, probably for the ſame reaſon which had made men imagine, that the orbits of the Planets muſt neceſſarily be perfectly circular. But Sir Iſaac Newton, from mechanical principles, concluded, that, as the parts of the Earth muſt be more agitated by her diurnal revolution at the Equator, than at the Poles, they muſt neceſſarily be ſomewhat elevated at the firſt, and flattened at the ſecond. The obſervation, that the oſcillations of pendulums were ſlower at the Equator than at the Poles, ſeeming to demonſtrate, that gravity was ſtronger at the Poles, and weaker at the Equator, proved, he thought, that the Equator was further from the centre than the Poles. All the meaſures, however, which had hitherto been made of the Earth, ſeemed to ſhow the contrary, that it was drawn out towards the Poles, and flattened towards the Equator. Newton, however, preferred his mechanical computations to the former meaſures of Geographers and Aſtronomers; and in this he was confirmed by the obſervations of Aſtronomers on the figure of Jupiter, whoſe diameter at the Pole ſeems to be to his diameter at the Equator, as twelve to thirteen; a much greater inequality than could be ſuppoſed to take place betwixt the correſpondent diameters of the Earth, but which was exactly proportioned to the ſuperior bulk of Jupiter, and the ſuperior rapidity with which he performs his diurnal revolutions. The obſervations of Aſtronomers at Lapland and Peru have fully confirmed Sir Iſaac's ſyſtem, and have not only demonſtrated, that the figure of the Earth is, in general, ſuch as he ſuppoſed it; but that the proportion of its axis to the diameter of its Equator is almoſt preciſely ſuch as he had computed it. And of all the proofs that have ever been adduced of the diurnal revolution of the Earth, this perhaps is the moſt ſolid and ſatisfactory.

Hipparchus, by comparing his own obſervations with thoſe of ſome former Aſtronomers, had found that the equinoxial points were

not

not always oppoſite to the ſame part of the Heavens, but that they advanced gradually eaſtward by ſo ſlow a motion, as to be ſcarce ſenſible in one hundred years, and which would require thirty-ſix thouſand to make a complete revolution of the Equinoxes, and to carry them ſucceſſively through all the different points of the Ecliptic. More accurate obſervations diſcovered that this proceſſion of the Equinoxes was not ſo ſlow as Hipparchus had imagined it, and that it required ſomewhat leſs than twenty-ſix thouſand years to give them a complete revolution. While the ancient ſyſtem of Aſtronomy, which repreſented the Earth as the immoveable centre of the univerſe, took place, this appearance was neceſſarily accounted for, by ſuppoſing that the Firmament, beſides its rapid diurnal revolution round the poles of the Equator, had likewiſe a ſlow periodical one round thoſe of the Ecliptic. And when the ſyſtem of Hipparchus was by the ſchoolmen united with the ſolid Spheres of Ariſtotle, they placed a new chriſtaline Sphere above the Firmament, in order to join this motion to the reſt. In the Copernican ſyſtem, this appearance had hitherto been connected with the other parts of that hypotheſis, by ſuppoſing a ſmall revolution in the Earth's axis from eaſt to weſt. Sir Iſaac Newton connected this motion by the ſame principle of gravity, by which he had united all the others, and ſhewed, how the elevation of the parts of the Earth at the Equator muſt, by the attraction of the Sun, produce the ſame retrograde motion of the Nodes of the Ecliptic, which it produced of the Nodes of the Moon. He computed the quantity of motion which could ariſe from this action of the Sun, and his calculations here too entirely correſponded with the obſervations of Aſtronomers.

Comets had hitherto, of all the appearances in the Heavens, been the leaſt attended to by Aſtronomers. The rarity and inconſtancy of their appearance, ſeemed to ſeparate them entirely from the conſtant, regular, and uniform objects in the Heavens, and to make them re-

ſemble more the inconſtant, tranſitory, and accidental phænomena of thoſe regions that are in the neighbourhood of the Earth. Ariſtotle, Eudoxus, Hipparchus, Ptolemy, and Purbach, therefore, had all degraded them below the Moon, and ranked them among the meteors of the upper regions of the air. The obſervations of Tycho Brahe demonſtrated, that they aſcended into the celeſtial regions, and were often higher than Venus or the Sun. Des Cartes, at random, ſuppoſed them to be always higher than even the orbit of Saturn; and ſeems, by the ſuperior elevation he thus beſtowed upon them, to have been willing to compenſate that unjuſt degradation which they had ſuffered for ſo many ages before. The obſervations of ſome later Aſtronomers demonſtrated, that they too revolved about the Sun, and might therefore be parts of the Solar Syſtem. Newton accordingly applied his mechanical principle of gravity to explain the motions of theſe bodies. That they deſcribed equal areas in equal times, had been diſcovered by the obſervations of ſome later Aſtronomers; and Newton endeavoured to ſhow how from this principle, and thoſe obſervations, the nature and poſition of their ſeveral orbits might be aſcertained, and their periodic times determined. His followers have, from his principles, ventured even to predict the returns of ſeveral of them, particularly of one which is to make its appearance in 1758 *. We muſt wait for that time before we can determine, whether his philoſophy correſponds as happily to this part of the ſyſtem as to all the others. In the mean time, however, the ductility of this principle, which applied itſelf ſo happily to theſe, the moſt irregular of all the celeſtial appearances, and which has introduced ſuch complete coherence into the motions of all the Heavenly Bodies, has ſerved not a little to recommend it to the imaginations of mankind.

* It muſt be obſerved, that the whole of this Eſſay was written previous to the date here mentioned; and that the return of the comet happened agreeably to the prediction.

But of all the attempts of the Newtonian Philoſophy, that which would appear to be the moſt above the reach of human reaſon and experience, is the attempt to compute the weights and denſities of the Sun, and of the ſeveral Planets. An attempt, however, which was indiſpenſibly neceſſary to complete the coherence of the Newtonian ſyſtem. The power of attraction which, according to the theory of gravity, each body poſſeſſes, is in proportion to the quantity of matter contained in that body. But the periodic time in which one body, at a given diſtance, revolves round another that attracts it, is ſhorter in proportion as this power is greater, and conſequently as the quantity of matter in the attracting body. If the denſities of Jupiter and Saturn were the ſame with that of the Earth, the periodic times of their ſeveral Satellites would be ſhorter than by obſervation they are found to be. Becauſe the quantity of matter, and conſequently the attracting power of each of them, would be as the cubes of their diameters. By comparing the bulks of thoſe Planets, and the periodic times of their Satellites, it is found that, upon the hypotheſis of gravity, the denſity of Jupiter muſt be greater than that of Saturn, and the denſity of the Earth greater than that of Jupiter. This ſeems to eſtabliſh it as a law in the ſyſtem, that the nearer the ſeveral Planets approach to the Sun, the denſity of their matter is the greater: a conſtitution of things which would ſeem to be the moſt advantageous of any that could have been eſtabliſhed; as water of the ſame denſity with that of our Earth, would freeze under the Equator of Saturn, and boil under that of Mercury.

Such is the ſyſtem of Sir Iſaac Newton, a ſyſtem whoſe parts are all more ſtrictly connected together, than thoſe of any other philoſophical hypotheſis. Allow his principle, the univerſality of gravity, and that it decreaſes as the ſquares of the diſtance increaſe, and all the appearances, which he joins together by it, neceſſarily follow. Neither is their connection merely a general and looſe con-

nection, as that of moſt other ſyſtems, in which either theſe appearances, or ſome ſuch like appearances, might indifferently have been expected. It is every where the moſt preciſe and particular that can be imagined, and aſcertains the time, the place, the quantity, the duration of each individual phænomenon, to be exactly ſuch as, by obſervation, they have been determined to be. Neither are the principles of union, which it employs, ſuch as the imagination can find any difficulty in going along with. The gravity of matter is, of all its qualities, after its inertneſs, that which is moſt familiar to us. We never act upon it without having occaſion to obſerve this property. The law too, by which it is ſuppoſed to diminiſh as it recedes from its centre, is the ſame which takes place in all other qualities which are propagated in rays from a centre, in light, and in every thing elſe of the ſame kind. It is ſuch, that we not only find that it does take place in all ſuch qualities, but we are neceſſarily determined to conceive that, from the nature of the thing, it muſt take place. The oppoſition which was made in France, and in ſome other foreign nations, to the prevalence of this ſyſtem, did not ariſe from any difficulty which mankind naturally felt in conceiving gravity as an original and primary mover in the conſtitution of the univerſe. The Carteſian ſyſtem, which had prevailed ſo generally before it, had accuſtomed mankind to conceive motion as never beginning, but in conſequence of impulſe, and had connected the deſcent of heavy bodies, near the ſurface of the Earth, and the other Planets, by this more general bond of union; and it was the attachment the world had conceived for this account of things, which indiſpoſed them to that of Sir Iſaac Newton. His ſyſtem, however, now prevails over all oppoſition, and has advanced to the acquiſition of the moſt univerſal empire that was ever eſtabliſhed in philoſophy. His principles, it muſt be acknowledged, have a degree of firmneſs and ſolidity that we ſhould in vain look for in any other ſyſtem. The moſt ſceptical cannot avoid feeling this. They not only con-

nect together moſt perfectly all the phænomena of the Heavens, which had been obſerved before his time, but thoſe alſo which the perſevering induſtry and more perfect inſtruments of later Aſtronomers have made known to us; have been either eaſily and immediately explained by the application of his principles, or have been explained in conſequence of more laborious and accurate calculations from theſe principles, than had been inſtituted before. And even we, while we have been endeavouring to repreſent all philoſophical ſyſtems as mere inventions of the imagination, to connect together the otherwiſe disjointed and diſcordant phænomena of nature, have inſenſibly been drawn in, to make uſe of language expreſſing the connecting principles of this one, as if they were the real chains which Nature makes uſe of to bind together her ſeveral operations. Can we wonder then, that it ſhould have gained the general and complete approbation of mankind, and that it ſhould now be conſidered, not as an attempt to connect in the imagination the phænomena of the Heavens, but as the greateſt diſcovery that ever was made by man, the diſcovery of an immenſe chain of the moſt important and ſublime truths, all cloſely connected together, by one capital fact, of the reality of which we have daily experience. * * * *

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NOTE by the EDITORS.

The Author, at the end of this Eſſay, left ſome Notes and Memorandums, from which it appears, that he conſidered this laſt part of his Hiſtory of Aſtronomy as imperfect, and needing ſeveral additions. The Editors, however, choſe rather to publiſh than to ſuppreſs it. It muſt be viewed, not as a Hiſtory or Account of Sir Iſaac Newton's Aſtronomy, but chiefly as an additional illuſtration of thoſe Principles in the Human Mind which Mr. Smith has pointed out to be the univerſal motives of Philoſophical Reſearches.

THE

PRINCIPLES

WHICH LEAD AND DIRECT

PHILOSOPHICAL ENQUIRIES;

ILLUSTRATED BY THE

HISTORY of the ANCIENT PHYSICS.

HISTORY

OF THE

ANCIENT PHYSICS.

FROM arranging and methodizing the Syſtem of the Heavens, Philoſophy deſcended to the conſideration of the inferior parts of Nature, of the Earth, and of the bodies which immediately ſurround it. If the objects, which were here preſented to its view, were inferior in greatneſs or beauty, and therefore leſs apt to attract the attention of the mind, they were more apt, when they came to be attended to, to embarraſs and perplex it, by the variety of their ſpecies, and by the intricacy and ſeeming irregularity of the laws or orders of their ſucceſſion. The ſpecies of objects in the Heavens are few in number; the Sun, the Moon, the Planets, and the Fixed Stars, are all which thoſe philoſophers could diſtinguiſh. All the changes too, which are ever obſerved in theſe bodies, evidently ariſe from ſome difference in the velocity and direction of their ſeveral motions; but the variety of meteors in the air, of clouds, rainbows, thunder, lightning, winds, rain, hail, ſnow, is vaſtly greater; and the order of their ſucceſſion ſeems to be ſtill more irregular and unconſtant. The ſpecies of foſſils, minerals, plants, animals, which are found in the Waters, and near the ſurface of the Earth, are ſtill more intricately diverſified; and if we

regard the different manners of their production, their mutual influence in altering, deſtroying, ſupporting one another, the orders of their ſucceſſion ſeem to admit of an almoſt infinite variety. If the imagination, therefore, when it conſidered the appearances in the Heavens, was often perplexed, and driven out of its natural career, it would be much more expoſed to the ſame embarraſſment, when it directed its attention to the objects which the Earth preſented to it, and when it endeavoured to trace their progreſs and ſucceſſive revolutions.

To introduce order and coherence into the mind's conception of this ſeeming chaos of diſſimilar and disjointed appearances, it was neceſſary to deduce all their qualities, operations, and laws of ſucceſſion, from thoſe of ſome particular things, with which it was perfectly acquainted and familiar, and along which its imagination could glide ſmoothly and eaſily, and without interruption. But as we would in vain attempt to deduce the heat of a ſtove from that of an open chimney, unleſs we could ſhow that the ſame fire which was expoſed in the one, lay concealed in the other; ſo it was impoſſible to deduce the qualities and laws of ſucceſſion, obſerved in the more uncommon appearances of Nature, from thoſe of ſuch as were more familiar, if thoſe cuſtomary objects were not ſuppoſed, however diſguiſed in their appearance, to enter into the compoſition of thoſe rarer and more ſingular phænomena. To render, therefore, this lower part of the great theatre of nature a coherent ſpectacle to the imagination, it became neceſſary to ſuppoſe, firſt, That all the ſtrange objects of which it conſiſted were made up out of a few, with which the mind was extremely familiar: and ſecondly, That all their qualities, operations, and rules of ſucceſſion, were no more than different diverſifications of thoſe to which it had long been accuſtomed, in theſe primary and elementary objects.

Of

Of all the bodies of which theſe inferior parts of the univerſe ſeem to be compoſed, thoſe with which we are moſt familiar, are the Earth, which we tread upon; the Water, which we every day uſe; the Air, which we conſtantly breath; and the Fire, whoſe benign influence is not only required for preparing the common neceſſaries of life, but for the continual ſupport of that vital principle which actuates both plants and animals. Theſe, therefore, were by Empedocles, and the other philoſophers of the Italian ſchool, ſuppoſed to be the elements, out of which, at leaſt, all the inferior parts of nature were compoſed. The familiarity of thoſe bodies to the mind, naturally diſpoſed it to look for ſome reſemblance to them in whatever elſe was preſented to its conſideration. The diſcovery of ſome ſuch reſemblance united the new object to an aſſortment of things, with which the imagination was perfectly acquainted. And if any analogy could be obſerved betwixt the operations and laws of ſucceſſion of the compound, and thoſe of the ſimple objects, the movement of the fancy, in tracing their progreſs, became quite ſmooth, and natural, and eaſy. This natural anticipation, too, was ſtill more confirmed by ſuch a ſlight and inaccurate analyſis of things, as could be expected in the infancy of ſcience, when the curioſity of mankind, graſping at an account of all things before it had got full ſatisfaction with regard to any one, hurried on to build, in imagination, the immenſe fabric of the univerſe. The heat, obſerved in both plants and animals, ſeemed to demonſtrate, that Fire made a part of their compoſition. Air was not leſs neceſſary for the ſubſiſtance of both, and ſeemed, too, to enter into the fabric of animals by reſpiration, and into that of plants by ſome other means. The juices which circulated through them ſhowed how much of their texture was owing to Water. And their reſolution into Earth by putrefaction, diſcovered that this element had not been left out in their original formation. A ſimilar analyſis ſeemed to ſhew the ſame principles in moſt other compound bodies.

The vaſt extent of thoſe bodies ſeemed to render them, upon another account, proper to be the great ſtores out of which nature compounded all the other ſpecies of things. Earth and Water divide almoſt the whole of the terreſtrial globe between them. The thin tranſparent covering of the Air ſurrounds it to an immenſe height upon all ſides. Fire, with its attendant, light, ſeems to deſcend from the celeſtial regions, and might, therefore, either be ſuppoſed to be diffuſed through the whole of thoſe ætherial ſpaces, as well as to be condenſed and conglobated in thoſe luminous bodies, which ſparkle acroſs them, as by the Stoics; or, to be placed immediately under the ſphere of the Moon, in the region next below them, as by the Peripatetics, who could not reconcile the devouring nature of Fire with the ſuppoſed unchangeable eſſence of their ſolid and cryſtalline ſpheres.

The qualities, too, by which we are chiefly accuſtomed to characterize and diſtinguiſh natural bodies, are all of them found, in the higheſt degree in thoſe Four Elements. The great diviſions of the objects, near the ſurface of the Earth, are thoſe into hot and cold, moiſt and dry, light and heavy. Theſe are the moſt remarkable properties of bodies; and it is upon them that many of their other moſt ſenſible qualities and powers ſeem to depend. Of theſe, heat and cold were naturally enough regarded by thoſe firſt enquirers into nature, as the active, moiſture and dryneſs, as the paſſive qualities of matter. It was the temperature of heat and cold which ſeemed to occaſion the growth and diſſolution of plants and animals; as appeared evident from the effects of the change of the ſeaſons upon both. A proper degree of moiſture and dryneſs was not leſs neceſſary for theſe purpoſes; as was evident from the different effects and productions of wet and dry ſeaſons and ſoils. It was the heat and cold, however, which actuated and determined thoſe two otherwiſe inert qualities of things, to a ſtate either of reſt or motion.

Gravity

Gravity and levity were regarded as the two principles of motion, which directed all ſublunary things to their proper place: and all thoſe ſix qualities, taken together, were, upon ſuch an inattentive view of nature, as muſt be expected in the beginnings of philoſophy, readily enough apprehended to be capable of connecting together the moſt remarkable revolutions, which occur in theſe inferior parts of the univerſe. Heat and dryneſs were the qualities which characterized the element of Fire; heat and moiſture that of Air; moiſture and cold that of Water; cold and dryneſs that of Earth. The natural motion of two of theſe elements, Earth and Water, was downwards, upon account of their gravity. This tendency, however, was ſtronger in the one than in the other, upon account of the ſuperior gravity of Earth. The natural motion of the two other elements, Fire and Air, was upwards, upon account of their levity; and this tendency, too, was ſtronger in the one than in the other, upon account of the ſuperior levity of Fire. Let us not deſpiſe thoſe ancient philoſophers, for thus ſuppoſing, that theſe two elements had a poſitive levity, or a real tendency upwards. Let us remember, that this notion has an appearance of being confirmed by the moſt obvious obſervations; that thoſe facts and experiments, which demonſtrate the weight of the Air, and which no ſuperior ſagacity, but chance alone, preſented to the moderns, were altogether unknown to them; and that, what might, in ſome meaſure, have ſupplied the place of thoſe experiments, the reaſonings concerning the cauſes of the aſcent of bodies, in fluids ſpecifically heavier than themſelves, ſeem to have been unknown in the ancient world, till Archimedes diſcovered them, long after their ſyſtem of phyſics was completed, and had acquired an eſtabliſhed reputation: that thoſe reaſonings are far from being obvious, and that by their inventor, they ſeem to have been thought applicable only to the aſcent of Solids in Water, and not even to that of Solids in air, much leſs to that of one fluid in another. But it is this laſt only which could explain the aſcent of

flame,

flame, vapours, and fiery exhalations, without the ſuppoſition of a ſpecific levity.

Thus, each of thoſe Four Elements had, in the ſyſtem of the univerſe, a place which was peculiarly allotted to it, and to which it naturally tended. Earth and Water rolled down to the centre; the Air ſpread itſelf above them; while the Fire ſoared aloft, either to the celeſtial region, or to that which was immediately below it. When each of thoſe ſimple bodies had thus obtained its proper ſphere, there was nothing in the nature of any one of them to make it paſs into the place of the other, to make the Fire deſcend into the Air, the Air into the Water, or the Water into the Earth; or, on the contrary, to bring up the Earth into the place of the Water, the Water into that of the Air, or the Air into that of the Fire. All ſublunary things, therefore, if left to themſelves, would have remained in an eternal repoſe. The revolution of the heavens, thoſe of the Sun, Moon, and Five Planets, by producing the viciſſitudes of Day and Night, and of the Seaſons, prevented this torpor and inactivity from reigning through the inferior parts of nature; inflamed by the rapidity of their circumvolutions, the element of Fire, and forced it violently downwards into the Air, into the Water, and into the Earth, and thereby produced thoſe mixtures of the different elements which kept up the motion and circulation of the lower parts of nature; occaſioned, ſometimes, the entire tranſmutation of one element into another, and ſometimes the production of forms and ſpecies different from them all, and in which, though the qualities of them all might be found, they were ſo altered and attempered by the mixture, as ſcarce to be diſtinguiſhable.

Thus, if a ſmall quantity of Fire was mixed with a great quantity of Air, the moiſture and moderate warmth of the one entirely ſurmounted and changed into their own eſſence the intenſe heat and

dryneſs of the other; and the whole aggregate became Air. The contrary of which happened, if a ſmall quantity of Air was mixed with a great quantity of Fire: the whole, in this caſe, became Fire. In the ſame manner, if a ſmall quantity of Fire was mixed with a great quantity of Water, then, either the moiſture and cold of the Water might ſurmount the heat and dryneſs of the Fire, ſo as that the whole ſhould become Water; or, the moiſture of the Water might ſurmount the dryneſs of the Fire, while, in its turn, the heat of the Fire ſurmounted the coldneſs of the Water, ſo as that the whole aggregate, its qualities being heat and moiſture, ſhould become Air, which was regarded as the more natural and eaſy metamorphoſis of the two. In the ſame manner they explained how like changes were produced by the different mixtures of Fire and Earth, Earth and Water, Water and Air, Air and Earth; and thus they connected together the ſucceſſive tranſmutations of the elements into one another.

Every mixture of the Elements, however, did not produce an entire tranſmutation. They were ſometimes ſo blended together, that the qualities of the one, not being able to deſtroy, ſerved only to attemper thoſe of the other. Thus Fire, when mixed with water, produced ſometimes a watery vapour, whoſe qualities were heat and moiſture; which partook at once of the levity of the Fire, and of the gravity of the Water, and which was elevated by the firſt into the Air, but retained by the laſt from aſcending into the region of Fire. The relative cold, which they ſuppoſed prevailed in the middle region of the Air, upon account of its equal diſtance, both from the region of Fire, and from the rays that are reflected by the ſurface of the Earth, condenſed this vapour into Water; the Fire eſcaped it, and flew upwards, and the Water fell down in rain, or, according to the different degrees of cold that prevailed in the different ſeaſons, was ſometimes congealed into ſnow, and ſometimes into hail. In the

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ſame manner, Fire, when mixed with Earth, produced ſometimes a fiery exhalation, whoſe qualities were heat and dryneſs, which being elevated by the levity of the firſt into the Air condenſed by the cold, ſo as to take fire, and being at the ſame time ſurrounded by watery vapours, burſt forth into thunder and lightning, and other fiery meteors. Thus they connected together the different appearances in the Air, by the qualities of their Four Elements; and from them, too, in the ſame manner, they endeavoured to deduce all the other qualities in the other homogeneous bodies, that are near the ſurface of the Earth. Thus, to give an example, with regard to the hardneſs and ſoftneſs of bodies; heat and moiſture, they obſerved, were the great ſoftners of matter. Whatever was hard, therefore, owed that quality either to the abſence of heat, or to the abſence of moiſture. Ice, cryſtal, lead, gold, and almoſt all metals, owed their hardneſs to the abſence of heat, and were, therefore, diſſolveable by Fire. Rock-ſalt, nitre, alum, and hard clay, owed that quality to the abſence of moiſture, and were, therefore, diſſolveable in water. And, in the ſame manner, they endeavoured to connect together moſt of the other tangible qualities of matter. Their principles of union, indeed, were often ſuch as had no real exiſtence, and were always vague and undetermined in the higheſt degree; they were ſuch, however, as might be expected in the beginnings of ſcience, and ſuch as, with all their imperfections, could enable mankind both to think and to talk, with more coherence, concerning thoſe general ſubjects, than without them they would have been capable of doing. Neither was their ſyſtem entirely devoid either of beauty or magnificence. Each of the Four Elements having a particular region allotted to it, had a place of reſt, to which it naturally tended, by its motion, either up or down, in a ſtraight line, and where, when it had arrived, it naturally ceaſed to move. Earth deſcended, till it arrived at the place of Earth; Water, till it arrived at that of Water; and Air, till it arrived at that of Air; and there each of them tended to a

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ſtate of eternal repoſe and inaction. The Spheres conſiſted of a Fifth Element, which was neither light nor heavy, and whoſe natural motion made it tend, neither to the center, nor from the center, but revolve round it in a circle. As, by this motion, they could never change their ſituation with regard to the center, they had no place of repoſe, no place to which they naturally tended more than to any other, but revolved round and round for ever. This Fifth Element was ſubject neither to generation nor corruption, nor alteration of any kind; for whatever changes may happen in the Heavens, the ſenſes can ſcarce perceive them, and their appearance is the ſame in one age as in another. The beauty, too, of their ſuppoſed cryſtalline ſpheres ſeemed ſtill more to entitle them to this diſtinction of unchangeable immortality. It was the motion of thoſe Spheres, which occaſioned the mixtures of the Elements, and from thence, the production of all the forms and ſpecies, that diverſify the world. It was the approach of the Sun and of the other Planets, to the different parts of the Earth, which, by forcing down the element of Fire, occaſioned the generation of thoſe forms. It was the receſs of thoſe bodies, which, by allowing each Element to eſcape to its proper ſphere, brought about, in an equal time, their corruption. It was the periods of thoſe great lights of Heaven, which meaſured out to all ſublunary things, the term of their duration, of their growth, and of their decay, either in one, or in a number of ſeaſons, according as the Elements of which they were compoſed, were either imperfectly or accurately blended and mixed with one another. Immortality, they could beſtow upon no individual form, becauſe the principles out of which it was formed, all tending to diſengage themſelves, and to return to their proper ſpheres, neceſſarily, at laſt, brought about its diſſolution. But, though all individuals were thus periſhable, and conſtantly decaying, every ſpecies was immortal, becauſe the ſubject matter out of which they were made, and the

revolution of the Heavens, the cauſe of their ſucceſſive generations, were always the ſame.

In the firſt ages of the world, the ſeeming incoherence of the appearances of nature, ſo confounded mankind, that they deſpaired of diſcovering in her operations any regular ſyſtem. Their ignorance and confuſion of thought, neceſſarily gave birth to that puſillanimous ſuperſtition, which aſcribes almoſt every unexpected event, to the arbitrary will of ſome deſigning, though inviſible beings, who produced it for ſome private and particular purpoſe. The idea of an univerſal mind, of a God of all, who originally formed the whole and who governs the whole by general laws, directed to the conſervation and proſperity of the whole, without regard to that of any private individual, was a notion to which they were utterly ſtrangers Their gods, though they were apprehended to interpoſe, upon ſome particular occaſions, were ſo far from being regarded, as the creators of the world, that their origin was apprehended to be poſterior to that of the world. The Earth, according to Heſiod, was the firſt production of the chaos. The Heavens aroſe out of the Earth, and from both together, all the gods, who afterwards inhabited them Nor was this notion confined to the vulgar, and to thoſe poets who ſeem to have recorded the vulgar theology. Of all the philoſopher of the Ionian ſchool, Anaxagoras, it is well known, was the firſt who ſuppoſed, that mind and underſtanding were requiſite to account for the firſt origin of the world, and who, therefore, compared with the other philoſophers of his time, talked, as Ariſtotle obſerves like a ſober man among drunkards; but whoſe opinion was, at that time, ſo remarkable, that he ſeems to have got a ſirname from it The ſame notion, of the ſpontaneous origin of the world, was embraced, too, as the ſame author tells us, by the early Pythagoreans a ſect, which, in the antient world, was never regarded as irreligious

Mind, and underſtanding, and conſequently Deity, being the moſt perfect, were neceſſarily, according to them, the laſt productions of Nature. For in all other things, what was moſt perfect, they obſerved, always came laſt. As in plants and animals, it is not the ſeed that is moſt perfect, but the complete animal, with all its members, in the one; and the complete plant, with all its branches, leaves, flowers, and fruits, in the other. This notion, which could take place only while Nature was ſtill conſidered as, in ſome meaſure, diſorderly and inconſtant in her operations, was neceſſarily renounced by thoſe philoſophers, when, upon a more attentive ſurvey, they diſcovered, or imagined they had diſcovered, more diſtinctly, the chain which bound all her different parts to one another. As ſoon as the Univerſe was regarded as a complete machine, as a coherent ſyſtem, governed by general laws, and directed to general ends, viz. its own preſervation and proſperity, and that of all the ſpecies that are in it; the reſemblance which it evidently bore to thoſe machines which are produced by human art, neceſſarily impreſſed thoſe ſages with a belief, that in the original formation of the world there muſt have been employed an art reſembling the human art, but as much ſuperior to it, as the world is ſuperior to the machines which that art produces. The unity of the ſyſtem, which, according to this ancient philoſophy, is moſt perfect, ſuggeſted the idea of the unity of that principle, by whoſe art it was formed; and thus, as ignorance begot ſuperſtition, ſcience gave birth to the firſt theiſm that aroſe among thoſe nations, who were not enlightened by divine Revelation. According to Timæus, who was followed by Plato, that intelligent Being, who formed the world, endowed it with a principle of life and underſtanding, which extends from its centre to its remoteſt circumference, which is conſcious of all its changes, and which governs and directs all its motions to the great end of its formation. This Soul of the world was itſelf a God, the greateſt of all the inferior, and created deities; of an eſſence that was indiſſoluble, by

any power but by that of him who made it, and which was united to the body of the world, ſo as to be inſeparable by every force, but his who joined them, from the exertion of which his goodneſs ſecured them. The beauty of the celeſtial ſpheres attracting the admiration of mankind, the conſtancy and regularity of their motions ſeeming to manifeſt peculiar wiſdom and underſtanding, they were each of them ſuppoſed to be animated by an Intelligence of a nature that was, in the ſame manner, indiſſoluble and immortal, and inſeparably united to that ſphere which it inhabited. All the mortal and changeable beings which people the ſurface of the earth were formed by thoſe inferior deities; for the revolutions of the heavenly bodies ſeemed plainly to influence the generation and growth of both plants and animals, whoſe frail and fading forms bore the too evident marks of the weakneſs of thoſe inferior cauſes, which joined their different parts to one another. According to Plato and Timæus, neither the Univerſe, nor even thoſe inferior deities, who govern the Univerſe, were eternal, but were formed in time, by the great Author of all things, out of that matter which had exiſted from all eternity. This at leaſt their words ſeem to import; and thus they are underſtood by Cicero, and by all the other writers of earlier antiquity, though ſome of the later Platoniſts have interpreted them differently.

According to Ariſtotle, who ſeems to have followed the doctrine of Ocellus, the world was eternal; the eternal effect of an eternal cauſe. He found it difficult, it would ſeem, to conceive what could hinder the Firſt Cauſe from exerting his divine energy from all eternity. At whatever time he began to exert it, he muſt have been at reſt during all the infinite ages of that eternity which had paſſed before it. To what obſtruction, from within or from without, could this be owing? or how could this obſtruction, if it ever had ſubſiſted, have ever been removed? His idea of the nature and manner of exiſtence of this Firſt Cauſe, as it is expreſſed in the laſt book of his Phyſics,

Phyſics, and the five laſt chapters of his Metaphyſics, is indeed obſcure and unintelligible in the higheſt degree, and has perplexed his commentators more than any other parts of his writings. Thus far, however, he ſeems to expreſs himſelf plainly enough: that the Firſt Heavens, that of the Fixed Stars, from which are derived the motions of all the reſt, is revolved by an eternal, immoveable, unchangeable, unextended being, whoſe eſſence conſiſts in intelligence, as that of a body conſiſts in ſolidity and extenſion; and which is therefore neceſſarily and always intelligent, as a body is neceſſarily and always extended: that this Being was the firſt and ſupreme mover of the Univerſe: that the inferior Planetary Spheres derived each of them its peculiar revolution from an inferior being of the ſame kind; eternal, immoveable, unextended, and neceſſarily intelligent: that the ſole object of the intelligence of thoſe beings was their own eſſence, and the revolution of their own ſpheres; all other inferior things being unworthy of their conſideration; and that therefore whatever was below the Moon was abandoned by the gods to the direction of Nature, and Chance, and Neceſſity. For though thoſe celeſtial beings were, by the revolutions of their ſeveral Spheres, the original cauſes of the generation and corruption of all ſublunary forms, they were cauſes who neither knew nor intended the effects which they produced. This renowned philoſopher ſeems in his theological notions, to have been directed by prejudices which though extremely natural, are not very philoſophical. The revolutions of the Heavens, by their grandeur and conſtancy, excited his admiration, and ſeemed, upon that account, to be effects not unworthy a Divine Intelligence. Whereas the meanneſs of many things, the diſorder and confuſion of all things below, exciting no ſuch agreeable emotion, ſeemed to have no marks of being directed by that Supreme Underſtanding. Yet, though this opinion ſaps the foundations of human worſhip, and muſt have the ſame effects upon ſociety as Atheiſm itſelf, one may eaſily trace, in the Meta-

phyſics upon which it is grounded, the origin of many of the notions, or rather of many of the expreſſions, in the ſcholaſtic theology, to which no notions can be annexed.

The Stoics, the moſt religious of all the ancient ſects of philoſophers, ſeem in this, as in moſt other things, to have altered and refined upon the doctrine of Plato. The order, harmony, and coherence which this philoſophy beſtowed upon the Univerſal Syſtem, ſtruck them with awe and veneration. As, in the rude ages of the world, whatever particular part of Nature excited the admiration of mankind, was apprehended to be animated by ſome particular divinity; ſo the whole of Nature having, by their reaſonings, become equally the object of admiration, was equally apprehended to be animated by a Univerſal Deity, to be itſelf a Divinity, an Animal; a term which to our ears ſeems by no means ſynonimous with the foregoing; whoſe body was the ſolid and ſenſible parts of Nature, and whoſe ſoul was that ætherial Fire, which penetrated and actuated the whole. For of all the four elements, out of which all things were compoſed, Fire or Æther ſeemed to be that which bore the greateſt reſemblance to the Vital Principle which informs both plants and animals, and therefore moſt likely to be the Vital Principle which animated the Univerſe. This infinite and unbounded Æther, which extended itſelf from the centre beyond the remoteſt circumference of Nature, and was endowed with the moſt conſummate reaſon and intelligence, or rather was itſelf the very eſſence of reaſon and intelligence, had originally formed the world, and had communicated a portion, or ray, of its own eſſence to whatever was endowed with life and ſenſation, which, upon the diſſolution of thoſe forms, either immediately or ſometime after, was again abſorbed into that ocean of Deity from whence it had originally been detached. In this ſyſtem the Sun, the Moon, the Planets, and the Fixed Stars, were each of them alſo inferior divinities, animated by a detached

detached portion of that ætherial eſſence which was the ſoul of the world. In the ſyſtem of Plato, the Intelligence which animated the world was different from that which originally formed it. Neither were theſe which animated the celeſtial ſpheres, nor thoſe which informed inferior terreſtrial animals, regarded as portions of this plaſtic ſoul of the world. Upon the diſſolution of animals, therefore, their ſouls were not abſorbed in the ſoul of the world, but had a ſeparate and eternal exiſtence, which gave birth to the notion of the tranſmigration of ſouls. Neither did it ſeem unnatural, that, as the ſame matter which had compoſed one animal body might be employed to compoſe another, that the ſame intelligence which had animated one ſuch being ſhould again animate another. But in the ſyſtem of the Stoics, the intelligence which originally formed, and that which animated the world, were one and the ſame, all inferior intelligences were detached portions of the great one; and therefore, in a longer, or in a ſhorter time, were all of them, even the gods themſelves, who animated the celeſtial bodies, to be at laſt reſolved into the infinite eſſence of this almighty Jupiter, who, at a deſtined period, ſhould, by an univerſal conflagration, wrap up all things, in that ætherial and fiery nature, out of which they had originally been deduced, again to bring forth a new Heaven and a new Earth, new animals, new men, new deities; all of which would again, at a fated time, be ſwallowed up in a like conflagration, again to be re-produced, and again to be re-deſtroyed, and ſo on without end.

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WHICH LEAD AND DIRECT

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ANCIENT LOGICS and METAPHYSICS.

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ANCIENT LOGICS and METAPHYSICS.

In every tranſmutation, either of one element into another, or of one compound body, either into the elements out of which it was compoſed, or into another compound body, it ſeemed evident, that, both in the old and in the new ſpecies, there was ſomething that was the ſame, and ſomething that was different. When Fire was changed into Air, or Water into Earth, the Stuff, or Subject-matter of this Air and this Earth, was evidently the ſame with that of the former Fire or Water; but the Nature or Species of thoſe new bodies was entirely different. When, in the ſame manner, a number of freſh, green, and odoriferous flowers were thrown together in a heap, they, in a ſhort time, entirely changed their nature, became putrid and loathſome, and diſſolved into a confuſed maſs of ordure, which bore no reſemblance, either in its ſenſible qualities or in its effects, to their former beautiful appearance. But how different ſoever the ſpecies, the ſubject-matter of the flowers, and of the ordure, was, in this caſe too, evidently the ſame. In every body, therefore, whether ſimple or mixed, there were evidently two principles, whoſe combination conſtituted the whole nature of that particular body. The firſt was the Stuff, or Subject-matter, out of which it was made; the ſecond was the

Species, the Specific Eſſence, the Eſſential, or, as the ſchoolmen have called it, the Subſtantial Form of the Body. The firſt ſeemed to be the ſame in all bodies, and to have neither qualities nor powers of any kind, but to be altogether inert and imperceptible by any of the ſenſes, till it was qualified and rendered ſenſible by its union with ſome ſpecies or eſſential form. All the qualities and powers of bodies ſeemed to depend upon their ſpecies or eſſential forms. It was not the ſtuff or matter of Fire, or Air, or Earth, or Water, which enabled thoſe elements to produce their ſeveral effects, but that eſſential form which was peculiar to each of them. For it ſeemed evident, that Fire muſt produce the effects of Fire, by that which rendered it Fire; Air, by that which rendered it Air; and that in the ſame manner all other ſimple and mixed bodies muſt produce their ſeveral effects, by that which conſtituted them ſuch or ſuch bodies; that is, by their ſpecific Eſſence or eſſential forms. But it is from the effects of bodies upon one another, that all the changes and revolutions in the material world ariſe. Since theſe, therefore, depend upon the ſpecific eſſences of thoſe bodies, it muſt be the buſineſs of philoſophy, that ſcience which endeavours to connect together all the different changes that occur in the world, to determine wherein the ſpecific Eſſence of each object conſiſts, in order to foreſee what changes or revolutions may be expected from it. But the ſpecific Eſſence of each individual object is not that which is peculiar to it as an individual, but that which is common to it, with all other objects of the ſame kind. Thus the ſpecific Eſſence of the Water, which now ſtands before me, does not conſiſt in its being heated by the Fire, or cooled by the Air, in ſuch a particular degree; in its being contained in a veſſel of ſuch a form, or of ſuch dimenſions. Theſe are all accidental circumſtances, which are altogether extraneous to its general nature, and upon which none of its effects as Water depend. Philoſophy, therefore, in conſidering the general nature of Water, takes

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no notice of thoſe particularities which are peculiar to this Water, but confines itſelf to thoſe things which are common to all water. If, in the progreſs of its enquiries, it ſhould deſcend to conſider the nature of Water that is modified by ſuch particular accidents, it ſtill would not confine its conſideration to this water contained in this veſſel, and thus heated at this fire, but would extend its views to Water in general contained in ſuch kind of veſſels, and heated to ſuch a degree at ſuch a fire. In every caſe, therefore, Species, or Univerſals, and not Individuals, are the objects of Philoſophy. Becauſe whatever effects are produced by individuals, whatever changes can flow from them, muſt all proceed from ſome univerſal nature that is contained in them. As it was the buſineſs of Phyſics, or Natural Philoſophy, to determine wherein conſiſted the Nature and Eſſence of every particular Species of things, in order to connect together all the different events that occur in the material world; ſo there were two other ſciences, which, though they had originally ariſen out of that ſyſtem of Natural Philoſophy I have juſt been deſcribing, were, however, apprehended to go before it, in the order in which the knowledge of Nature ought to be communicated. The firſt of theſe, Metaphyſics, conſidered the general nature of Univerſals, and the different ſorts or ſpecies into which they might be divided. The ſecond of theſe, Logics, was built upon this doctrine of Metaphyſics; and from the general nature of Univerſals, and of the ſorts into which they were divided, endeavoured to aſcertain the general rules by which we might diſtribute all particular objects into general claſſes, and determine to what claſs each individual object belonged; for in this, they juſtly enough apprehended, conſiſted the whole art of philoſophical reaſoning. As the firſt of theſe two ſciences, Metaphyſics, is altogether ſubordinate to the ſecond, Logic, they ſeem, before the time of Ariſtotle, to have been regarded as one, and to have made up between them that ancient Dialectic of which we hear ſo much, and of which we underſtand ſo little: neither does this ſeparation ſeem to have been much attended to,

either by his own followers, the ancient Peripatetics, or by any other of the old ſects of philoſophers. The later ſchoolmen, indeed, have diſtinguiſhed between Ontology and Logic; but their Ontology contains but a ſmall part of what is the ſubject of the metaphyſical books of Ariſtotle, the greater part of which, the doctrines of Univerſals, and every thing that is preparatory to the arts of defining and dividing, has, ſince the days of Porphery, been inſerted into their Logic.

According to Plato and Timæus, the principles out of which the Deity formed the World, and which were themſelves eternal, were three in number. The Subject-matter of things, the Species or ſpecific Eſſences of things, and what was made out of theſe, the ſenſible objects themſelves. Theſe laſt had no proper or durable exiſtence, but were in perpetual flux and ſucceſſion. For as Heraclitus had ſaid, that no man ever paſſed the ſame river twice, becauſe the water which he had paſſed over once was gone before he could paſs over it a ſecond time; ſo, in the ſame manner, no man ever ſaw, or heard, or touched the ſame ſenſible object twice. When I look at the window, for example, the viſible ſpecies, which ſtrikes my eyes this moment, though reſembling, is different from that which ſtruck my eyes the immediately preceding moment. When I ring the bell, the ſound, or audible ſpecies which I hear this moment, though reſembling in the ſame manner, is different, however, from that which I heard the moment before. When I lay my hand on the table, the tangible ſpecies which I feel this moment, though reſembling, in the ſame manner, is numerically different too from that which I felt the moment before. Our ſenſations, therefore, never properly exiſt or endure one moment; but, in the very inſtant of their generation, periſh and are annihilated for ever. Nor are the cauſes of thoſe ſenſations more permanent. No corporeal ſubſtance is ever exactly the ſame, either in whole or in any aſſignable part, during two ſucceſſive moments, but

but by the perpetual addition of new parts, as well as loſs of old ones, is in continual flux and ſucceſſion. Things of ſo fleeting a nature can never be the objects of ſcience, or of any ſteady or permanent judgment. While we look at them, in order to conſider them, they are changed and gone, and annihilated for ever. The objects of ſcience, and of all the ſteady judgments of the underſtanding, muſt be permanent, unchangeable, always exiſtent, and liable neither to generation nor corruption, nor alteration of any kind. Such are the ſpecies or ſpecific eſſences of things. Man is perpetually changing every particle of his body; and every thought of his mind is in continual flux and ſucceſſion. But humanity, or human nature, is always exiſtent, is always the ſame, is never generated, and is never corrupted. This, therefore, is the object of ſcience, reaſon, and underſtanding, as man is the object of ſenſe, and of thoſe inconſtant opinions which are founded upon ſenſe. As the objects of ſenſe were apprehended to have an external exiſtence, independent of the act of ſenſation, ſo theſe objects of the underſtanding were much more ſuppoſed to have an external exiſtence independent of the act of underſtanding. Thoſe external eſſences were, according to Plato, the exemplars, according to which the Deity formed the world, and all the ſenſible objects that are in it. The Deity comprehended within his infinite eſſence, all theſe ſpecies, or eternal exemplars, in the ſame manner as he comprehended all ſenſible objects.

Plato, however, ſeems to have regarded the firſt of thoſe as equally diſtinct with the ſecond from what we would now call the Ideas or Thoughts of the Divine Mind *, and even to have ſuppoſed, that

* He calls them, indeed, Ideas, a word which, in him, in Ariſtotle, and all the other writers of earlier antiquity, ſignifies a Species, and is perfectly ſynonimous with that other word Εἶδος, more frequently made uſe of by Ariſtotle. As, by ſome of the later ſects of philoſophers, particularly by the Stoics, all ſpecies, or ſpecific eſſences, were regarded as mere creatures of the mind, formed by abſtraction, which had no real exiſtence external to the thoughts that conceived them, the word Idea came, by degrees,

that they had a particular place of exiſtence, beyond the ſphere of the viſible corporeal world; though this has been much controverted, both

degrees, to its preſent ſignification, to mean, firſt, an abſtract thought or conception; and afterwards, a thought or conception of any kind; and thus became ſynonymous with that other Greek word Ενοια, from which it had originally a very different meaning. When the later Platoniſts, who lived at a time when the notion of the ſeparate exiſtence of ſpecific eſſences were univerſally exploded, began to comment upon the writings of Plato, and upon that ſtrange fancy that, in his writings, there was a double doctrine; and that they were intended to ſeem to mean one thing, while at bottom they meant a very different, which the writings of no man in his ſenſes ever were, or ever could be intended to do; they repreſented his doctrine as meaning no more, than that the Deity formed the world after what we would now call an Idea, or plan conceived in his own mind, in the ſame manner as any other artiſt. But, if Plato had meant to expreſs no more than this moſt natural and ſimple of all notions, he might ſurely have expreſſed it more plainly, and would hardly, one would think, have talked of it with ſo much emphaſis, as of ſomething which it required the utmoſt reach of thought to comprehend. According to this repreſentation, Plato's notion of Species, or Univerſals, was the ſame with that of Ariſtotle. Ariſtotle, however, does not ſeem to underſtand it as ſuch; he beſtows a great part of his Metaphyſics upon confuting it, and oppoſes it in all his other works; nor does he, in any one of them, give the leaſt hint, or inſinuation, as if it could be ſuſpected that, by the Ideas of Plato, was meant the thoughts or conceptions of the Divine Mind. Is it poſſible that he, who was twenty years in his ſchool, ſhould, during all that time, have miſunderſtood him, eſpecially when his meaning was *ſo very plain and obvious?* Neither is this notion of the ſeparate exiſtence of Species, diſtinct both from the mind which conceives them, and from the ſenſible objects which are made to reſemble them, one of thoſe doctrines which Plato would but ſeldom have occaſion to talk of. However it may be interpreted, it is the very baſis of his philoſophy; neither is there a ſingle dialogue in all his works which does not refer to it. Shall we ſuppoſe, that that great philoſopher, who appears to have been ſo much ſuperior to his maſter in every thing but eloquence, wilfully, and upon all occaſions, miſrepreſented, not one of the deep and myſterious doctrines of the philoſophy of Plato, but the firſt and moſt fundamental principle of all his reaſonings; when the writings of Plato were in the hands of every body; when his followers and diſciples were ſpread all over Greece; when almoſt every Athenian of diſtinction, that was nearly of the ſame age with Ariſtotle, muſt have been bred in his ſchool; when Speuſippus, the nephew and ſucceſſor of Plato, as well as Xenocrates, who continued the ſchool in the Academy, at the ſame time that Ariſtotle held his in the Lyceum, muſt have been ready, at all times, to expoſe and affront him for ſuch groſs diſingenuity. Does not Cicero, does not Seneca underſtand this doctrine in the ſame manner as Ariſtotle has repreſented it? Is there any author in all antiquity who ſeems to underſtand it otherwiſe, earlier than Plutarch, an author, who ſeems to have been as bad a critic in philoſophy as in hiſtory, and to have taken every thing at ſecond-hand in both, and who lived after the origin of that eclectic philoſophy, from whence the later Platoniſts aroſe, and who ſeems himſelf to have

both by the later Platoniſts, and by ſome very judicious modern critics, who have followed the interpretation of the later Platoniſts,

have been one of that ſect? Is there any one paſſage in any Greek author, near the time of Ariſtotle and Plato, in which the word Idea is uſed in its preſent meaning, to ſignify a thought or conception? Are not the words, which in all languages expreſs reality or exiſtence, directly oppoſed to thoſe which expreſs thought, or conception only? Or, is there any other difference betwixt a thing that exiſts, and a thing that does not exiſt, except this, that the one is a mere conception, and that the other is ſomething more than a conception? With what propriety, therefore, could Plato talk of thoſe eternal ſpecies, as of the only things which had any real exiſtence, if they were no more than the conceptions of the Divine Mind? Had not the Deity, according to Plato, as well as according to the Stoics, from all eternity, the idea of every individual, as well as of every ſpecies, and of the ſtate in which every individual was to be, in each different inſtance of its exiſtence? Were not all the divine ideas, therefore, of each individual, or of all the different ſtates, which each individual was to be in during the courſe of its exiſtence, equally eternal and unalterable with thoſe of the ſpecies? With what ſenſe, therefore, could Plato ſay, that the firſt were eternal, becauſe the Deity had conceived them from all eternity, ſince he had conceived the others from all eternity too, and ſince his ideas of the Species could, in this reſpect, have no advantage of thoſe of the individual? Does not Plato, in many different places, talk of the Ideas of Species or Univerſals as innate, and having been impreſſed upon the mind in its ſtate of pre-exiſtence, when it had an opportunity of viewing theſe Species as they are in themſelves, and not as they are expreſſed in their copies, or repreſentative upon earth? But if the only place of the exiſtence of thoſe Species was the Divine Mind, will not this ſuppoſe, that Plato either imagined, like Father Malbranche, that in its ſtate of pre-exiſtence, the mind ſaw all things in God; or that it was itſelf an emanation of the Divinity? That he maintained the firſt opinion, will not be pretended by any body who is at all verſed in the hiſtory of ſcience. That enthuſiaſtic notion, though it may ſeem to be favoured by ſome paſſages in the Fathers, was never, it is well known, coolly and literally maintained by any body before that Carteſian philoſopher. That the human mind was itſelf an emanation of the Divine, though it was the doctrine of the Stoics, was by no means that of Plato; though, upon the notion of a pretended double doctrine, the contrary has lately been aſſerted. According to Plato, the Deity formed the ſoul of the world out of that ſubſtance which is always the ſame, that is, out of Species or Univerſals; out of that which is always different, that is, out of corporeal ſubſtances; and out of a ſubſtance that was of a middle nature between theſe, which it is not eaſy to underſtand what he meant by. Out of a part of the ſame compoſition, he made thoſe inferior intelligences who animated the celeſtial ſpheres, to whom he delivered the remaining part of it, to form, from thence the ſouls of men and animals. The ſouls of thoſe inferior deities, though made out of a ſimilar ſubſtance or compoſition, were not regarded as parts, or emanations of that of the world; nor were thoſe of animals, in the ſame manner, regarded as parts or emanations of thoſe inferior deities; much leſs were any of them regarded as parts, or emanations of the great Author of all things.

as what did moſt honour to the judgment of that renowned philoſopher. All the objects in this world, continued he, are particular and individual. Here, therefore, the human mind has no opportunity of ſeeing any Species, or Univerſal Nature. Whatever ideas it has, therefore, of ſuch beings, for it plainly has them, it muſt derive from the memory of what it has ſeen, in ſome former period of its exiſtence, when it had an opportunity of viſiting the place or Sphere of Univerſals. For ſome time after it is immerſed in the body, during its infancy, its childhood, and a great part of its youth, the violence of thoſe paſſions which it derives from the body, and which are all directed to the particular and individual objects of this world, hinder it from turning its attention to thoſe Univerſal Natures, with which it had been converſant in the world from whence it came. The Ideas, of theſe, therefore, ſeem, in this firſt period of its exiſtence here, to be overwhelmed in the confuſion of thoſe turbulent emotions, and to be almoſt entirely wiped out of its remembrance. During the continuance of this ſtate, it is incapable of Reaſoning, Science and Philoſophy, which are converſant about Univerſals. Its whole attention is turned towards particular objects, concerning which, being directed by no general notions, it forms many vain and falſe opinions, and is filled with error, perplexity, and confuſion. But, when age has abated the violence of its paſſions, and compoſed the confuſion of its thoughts, it then becomes more capable of reflection, and of turning its attention to thoſe almoſt forgotten ideas of things with which it had been converſant in the former ſtate of its exiſtence. All the particular objects in this ſenſible world, being formed after the eternal exemplars in that intellectual world, awaken, upon account of their reſemblance, inſenſibly, and by ſlow degrees, the almoſt obliterated ideas of theſe laſt. The beauty, which is ſhared in different degrees among terreſtrial objects, revives the ſame idea of that Univerſal Nature of beauty which exiſts in the intellectual world: particular acts

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of juſtice, of the univerſal nature of juſtice; particular reaſonings, and particular ſciences, of the univerſal nature of ſcience, and reaſoning; particular roundneſſes, of the univerſal nature of roundneſs; particular ſquares, of the univerſal nature of ſquareneſs. Thus ſcience, which is converſant about Univerſals, is derived from memory; and to inſtruct any perſon concerning the general nature of any ſubject, is no more than to awaken in him the remembrance of what he formerly knew about it. This both Plato and Socrates imagined they could ſtill further confirm, by the fallacious experiment, which ſhewed, that a perſon might be led to diſcover himſelf, without any information, any general truth, of which he was before ignorant, merely by being aſked a number of properly arranged and connected queſtions concerning it.

The more the ſoul was accuſtomed to the conſideration of thoſe Univerſal Natures, the leſs it was attached to any particular and individual objects; it approached the nearer to the original perfection of its nature, from which, according to this philoſophy, it had fallen. Philoſophy, which accuſtoms it to conſider the general Eſſence of things only, and to abſtract from all their particular and ſenſible circumſtances, was, upon this account, regarded as the great purifier of the ſoul. As death ſeparated the ſoul from the body, and from the bodily ſenſes and paſſions, it reſtored it to that intellectual world, from whence it had originally deſcended, where no ſenſible Species called off its attention from thoſe general Eſſences of things. Philoſophy, in this life, habituating it to the ſame conſiderations, brings it, in ſome degree, to that ſtate of happineſs and perfection, to which death reſtores the ſouls of juſt men in a life to come.

Such was the doctrine of Plato concerning the Species or Specific Eſſence of things. This, at leaſt, is what his words ſeem to import, and thus he is underſtood by Ariſtotle, the moſt intelligent and the

moſt renowned of all his diſciples. It is a doctrine, which, like many of the other doctrines of abſtract Philoſophy, is more coherent in the expreſſion than in the idea; and which ſeems to have ariſen, more from the nature of language, than from the nature of things. With all its imperfections it was excuſable, in the beginnings of philoſophy, and is not a great deal more remote from the truth, than many others which have ſince been ſubſtituted in its room by ſome of the greateſt pretenders to accuracy and preciſion. Mankind have had, at all times, a ſtrong propenſity to realize their own abſtractions, of which we ſhall immediately ſee an example, in the notions of that very philoſopher who firſt expoſed the ill-grounded foundation of thoſe Ideas, or Univerſals, of Plato and Timæus. To explain the nature, and to account for the origin of general Ideas, is, even at this day, the greateſt difficulty in abſtract philoſophy. How the human mind, when it reaſons concerning the general nature of triangles, ſhould either conceive, as Mr. Locke imagines it does, the idea of a triangle, which is neither obtuſangular, nor rectangular, nor acutangular; but which was at once both none and all of thoſe together; or ſhould, as Malbranche thinks neceſſary for this purpoſe, comprehend at once, within its finite capacity, all poſſible triangles of all poſſible forms and dimenſions, which are infinite in number, is a queſtion, to which it is ſurely not eaſy to give a ſatisfactory anſwer. Malbranche, to ſolve it, had recourſe to the enthuſiaſtic and unintelligible notion of the intimate union of the human mind with the divine, in whoſe infinite eſſence the immenſity of ſuch ſpecies could alone be comprehended; and in which alone, therefore, all finite intelligences could have an opportunity of viewing them. If, after more than two thouſand years reaſoning about this ſubject, this ingenious and ſublime philoſopher was forced to have recourſe to ſo ſtrange a fancy, in order to explain it, can we wonder that Plato, in the very firſt dawnings of ſcience, ſhould, for the ſame purpoſe, adopt an hypotheſis, which

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has been thought, without much reaſon, indeed, to have ſome affinity to that of Malbranche, and which is not more out of the way?

What ſeems to have miſled thoſe early philoſophers, was, the notion, which appears, at firſt, natural enough, that thoſe things, out of which any object is compoſed, muſt exiſt antecedent to that object. But the things out of which all particular objects ſeem to be compoſed, are the ſtuff or matter of thoſe objects, and the form or ſpecific Eſſence, which determines them to be of this or that claſs of things. Theſe, therefore, it was thought, muſt have exiſted antecedent to the object which was made up between them. Plato, who held, that the ſenſible world, which, according to him, is the world of individuals, was made in time, neceſſarily conceived, that both the univerſal matter, the object of a ſpurious reaſon, and the ſpecific eſſence, the object of proper reaſon and philoſophy out of which it was compoſed, muſt have had a ſeparate exiſtence from all eternity. This intellectual world, very different from the intellectual world of Cudworth, though much of the language of the one has been borrowed from that of the other, was neceſſarily, and always exiſtent; whereas the ſenſible world owed its origin to the free will and bounty of its author

A notion of this kind, as long as it is expreſſed in very general language; as long as it is not much reſted upon; nor attempted to be very particularly and diſtinctly explained, paſſes eaſily enough, through the indolent imagination, accuſtomed to ſubſtitute words in the room of ideas; and if the words ſeem to hang eaſily together, requiring no great preciſion in the ideas. It vaniſhes, indeed; is diſcovered to be altogether incomprehenſible, and eludes the graſp of the imagination, upon an attentive conſideration. It requires, however, an attentive conſideration; and if it had been as fortunate

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as many other opinions of the ſame kind, and about the ſame ſubject, it might, without examination, have continued to be the current philoſophy for a century or two. Ariſtotle, however, ſeems immediately to have diſcovered, that it was impoſſible to conceive, as actually exiſtent, either that general matter, which was not determined by any particular ſpecies, or thoſe ſpecies which were not embodied, if one may ſay ſo, in ſome particular portion of matter. Ariſtotle, too, held, as we have already obſerved, the eternity of the ſenſible world. Though he held, therefore, that all ſenſible objects were made up of two principles, both of which, he calls, equally, ſubſtances, the matter and the ſpecific eſſence, he was not obliged to hold, like Plato, that thoſe principles exiſted prior in the order of time to the objects which they afterwards compoſed. They were prior, he ſaid, in nature, but not in time, according to a diſtinction which was of uſe to him upon ſome other occaſions. He diſtinguiſhed, too, betwixt actual and potential exiſtence. By the firſt, he ſeems to have underſtood, what is commonly meant, by exiſtence or reality; by the ſecond, the bare poſſibility of exiſtence. His meaning, I ſay, ſeems to amount to this; though he does not explain it preciſely in this manner. Neither the material Eſſence of body could, according to him, exiſt actually without being determined by ſome ſpecific Eſſence, to ſome particular claſs of things, nor any ſpecific Eſſence without being embodied in ſome particular portion of matter. Each of theſe two principles, however, could exiſt potentially in this ſeparate ſtate. That matter exiſted potentially, which, being endowed with a particular form, could be brought into actual exiſtence; and that form, which, by being embodied in a particular portion of matter, could, in the ſame manner, be called forth into the claſs of complete realities. This potential exiſtence of matter and form, he ſometimes talks of, in expreſſions which very much reſemble thoſe of Plato, to whoſe notion of ſeparate Eſſence it bears a very great affinity.

Ariſtotle, who ſeems in many things original, and who endeavoured to ſeem to be ſo in all things, added the principle of privation to thoſe of matter and form, which he had derived from the ancient Pythagorean ſchool. When Water is changed into Air, the tranſmutation is brought about by the material principle of thoſe two elements being deprived of the form of Water, and then aſſuming the form of Air. Privation, therefore, was a third principle oppoſite to form, which entered into the generation of every Species, which was always from ſome other Species. It was a principle of generation, but not of compoſition, as is obvious.

The Stoics, whoſe opinions were, in all the different parts of philoſophy, either the ſame with, or very nearly allied to thoſe of Ariſtotle and Plato, though often diſguiſed in very different language, held, that all things, even the elements themſelves, were compounded of two principles, upon one of which depended all the active; and upon the other, all the paſſive powers of theſe bodies. The laſt of theſe, they called the Matter; the firſt, the Cauſe, by which they meant the very ſame thing which Ariſtotle and Plato underſtood, by their ſpecific Eſſences. Matter, according to the Stoics, could have no exiſtence ſeparate from the cauſe or efficient principle which determined it to ſome particular claſs of things. Neither could the efficient principle exiſt ſeparately from the material, in which it was always neceſſarily embodied. Their opinion, therefore, ſo far coincided with that of the old Peripatetics. The efficient principle, they ſaid, was the Deity. By which they meant, that it was a detached portion of the etherial and divine nature, which penetrated all things, that conſtituted what Plato would have called the ſpecific Eſſence of each individual object; and ſo far their opinion coincides pretty nearly with that of the latter Platoniſts, who held, that the ſpecific Eſſences of all things were detached portions of their created deity, the ſoul of the world; and with that of

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ſome of the Arabian and Scholaſtic Commentators of Ariſtotle, who held, that the ſubſtantial forms of all things deſcended from thoſe Divine Eſſences which animated the Celeſtial Spheres. Such was the doctrine of the four principal Sects of the ancient Philoſophers, concerning the ſpecific Eſſences of things, of the old Pythagoreans, of the Academical, Peripatetic, and Stoical Sects.

As this doctrine of ſpecific Eſſences ſeems naturally enough to have ariſen from that ancient ſyſtem of Phyſics, which I have above deſcribed, and which is, by no means, devoid of probability, ſo many of the doctrines of that ſyſtem, which ſeem to us, who have been long accuſtomed to another, the moſt incomprehenſible, neceſſarily flow from this metaphyſical notion. Such are thoſe of generation, corruption, and alteration; of mixture, condenſation, and rarefaction. A body was generated or corrupted, when it changed its ſpecific Eſſence, and paſſed from one denomination to another. It was altered when it changed only ſome of its qualities, but ſtill retained the ſame ſpecific Eſſence, and the ſame denomination. Thus, when a flower was withered, it was not corrupted; though ſome of its qualities were changed, it ſtill retained the ſpecific Eſſence, and therefore juſtly paſſed under the denomination of a flower. But, when, in the further progreſs of its decay, it crumbled into earth, it was corrupted; it loſt the ſpecific Eſſence, or ſubſtantial form of the flower, and aſſumed that of the earth, and therefore juſtly changed its denomination.

The ſpecific Eſſence, or univerſal nature that was lodged in each particular claſs of bodies, was not itſelf the object of any of our ſenſes, but could be perceived only by the underſtanding. It was by the ſenſible qualities, however, that we judged of the ſpecific Eſſence of each object. Some of theſe ſenſible qualities, therefore, we regarded as eſſential, or ſuch as ſhowed, by their preſence or abſence,

ſence, the preſence or abſence of that eſſential form from which they neceſſarily flowed: Others were accidental, or ſuch whoſe preſence or abſence had no ſuch neceſſary conſequences. The firſt of theſe two ſorts of qualities was called Properties; the ſecond, Accidents.

In the Specific Eſſence of each object itſelf, they diſtinguiſhed two parts; one of which was peculiar and characteriſtical of the claſs of things of which that particular object was an individual, the other was common to it with ſome other higher claſſes of things. Theſe two parts were, to the Specific Eſſence, pretty much what the Matter and the Specific Eſſence were to each individual body. The one, which was called the Genus, was modified and determined by the other, which was called the Specific Difference, pretty much in the ſame manner as the univerſal matter contained in each body was modified and determined by the Specific Eſſence of that particular claſs of bodies. Theſe four, with the Specific Eſſence or Species itſelf, made up the number of the Five Univerſals, ſo well known in the ſchools by the names of Genus, Species, Differentia, Proprium, and Accidens.

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OF THE

NATURE OF THAT IMITATION

WHICH TAKES PLACE IN WHAT ARE CALLED

THE IMITATIVE ARTS.

OF THE

IMITATIVE ARTS.

PART I.

THE moſt perfect imitation of an object of any kind muſt in all caſes, it is evident, be another object of the ſame kind, made as exactly as poſſible after the ſame model. What, for example, would be the moſt perfect imitation of the carpet which now lies before me?—Another carpet, certainly, wrought as exactly as poſſible after the ſame pattern. But, whatever might be the merit or beauty of this ſecond carpet, it would not be ſuppoſed to derive any from the circumſtance of its having been made in imitation of the firſt. This circumſtance of its being not an original, but a copy, would even be conſidered as ſome diminution of that merit; a greater or ſmaller, in proportion as the object was of a nature to lay claim to a greater or ſmaller degree of admiration. It would not much diminiſh the merit of a common carpet, becauſe in ſuch trifling objects, which at beſt can lay claim to ſo little beauty or merit of any kind, we do not always think it worth while to affect originality: it would diminiſh a good deal that of a carpet of very exquiſite workmanſhip. In objects of ſtill greater importance, this exact, or, as it would be called, this ſervile imitation, would be conſidered as the

the moſt unpardonable blemiſh. To build another St. Peter's, or St. Paul's church, of exactly the ſame dimenſions, proportions, and ornaments with the preſent buildings at Rome, or London, would be ſuppoſed to argue ſuch a miſerable barrenneſs of genius and invention as would diſgrace the moſt expenſive magnificence.

The exact reſemblance of the correſpondent parts of the ſame object is frequently conſidered as a beauty, and the want of it as a deformity; as in the correſpondent members of the human body, in the oppoſite wings of the ſame building, in the oppoſite trees of the ſame alley, in the correſpondent compartments of the ſame piece of carpet-work, or of the ſame flower-garden, in the chairs or tables which ſtand in the correſpondent parts of the ſame room, &c. But in objects of the ſame kind, which in other reſpects are regarded as altogether ſeparate and unconnected, this exact reſemblance is ſeldom conſidered as a beauty, nor the want of it as a deformity. A man, and in the ſame manner a horſe, is handſome or ugly, each of them, on account of his own intrinſic beauty or deformity, without any regard to their reſembling or not reſembling, the one, another man, or the other, another horſe. A ſet of coach-horſes, indeed, is ſuppoſed to be handſomer when they are all exactly matched; but each horſe is, in this caſe, conſidered not as a ſeparated and unconnected object, or as a whole by himſelf, but as a part of another whole, to the other parts of which he ought to bear a certain correſpondence: Separated from the ſet, he derives neither beauty from his reſemblance, nor deformity from his unlikeneſs to the other horſes which compoſe it.

Even in the correſpondent parts of the ſame object, we frequently require no more than a reſemblance in the general outline. If the inferior members of thoſe correſpondent parts are too minute to be

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ſeen diſtinctly, without a ſeparate and diſtinct examination of each part by itſelf, as a ſeparate and unconnected object, we ſhould ſometimes even be diſpleaſed if the reſemblance was carried beyond this general outline. In the correſpondent parts of a room we frequently hang pictures of the ſame ſize; thoſe pictures, however, reſemble one another in nothing but the frame, or, perhaps, in the general character of the ſubject: If the one is a landſcape, the other is a landſcape too; if the one repreſents a religious or a Bacchanalian ſubject, its companion repreſents another of the ſame kind. Nobody ever thought of repeating the ſame picture in each correſpondent frame. The frame, and the general character of two or three pictures, is as much as the eye can comprehend at one view, or from one ſtation. Each picture, in order to be ſeen diſtinctly, and underſtood thoroughly, muſt be viewed from a particular ſtation, and examined by itſelf as a ſeparate and unconnected object. In a hall or portico, adorned with ſtatues, the nitches, or perhaps the pedeſtals, may exactly reſemble one another, but the ſtatues are always different. Even the maſks which are ſometimes carried upon the different key-ſtones of the ſame arcade, or of the correſpondent doors and windows of the ſame front, though they may all reſemble one another in the general outline, yet each of them has always its own peculiar features, and a grimace of its own. There are ſome Gothic buildings in which the correſpondent windows reſemble one another only in the general outline, and not in the ſmaller ornaments and ſubdiviſions. Theſe are different in each, and the architect had conſidered them as too minute to be ſeen diſtinctly, without a particular and ſeparate examination of each window by itſelf, as a ſeparate and unconnected object. A variety of this ſort, however, I think, is not agreeable. In objects which are ſuſceptible only of a certain inferior order of beauty, ſuch as the frames of pictures, the nitches or the pedeſtals of ſtatues, &c. there ſeems frequently to be-

be affectation in the ſtudy of variety, of which the merit is ſcarcely ever ſufficient to compenſate the want of that perſpicuity and diſtinctneſs, of that eaſineſs to be comprehended and remembered, which is the natural effect of exact uniformity. In a portico of the Corinthian or Ionic order, each column reſembles every other, not only in the general outline, but in all the minuteſt ornaments; though ſome of them, in order to be ſeen diſtinctly, may require a ſeparate and diſtinct examination in each column, and in the entablature of each intercolumnation. In the inlaid tables, which, according to the preſent faſhion, are ſometimes fixed in the correſpondent parts of the ſame room, the pictures only are different in each. All the other more frivolous and fanciful ornaments are commonly, ſo far at leaſt as I have obſerved the faſhion, the ſame in them all. Thoſe ornaments, however, in order to be ſeen diſtinctly, require a ſeparate and diſtinct examination of each table.

The extraordinary reſemblance of two natural objects, of twins, for example, is regarded as a curious circumſtance; which, though it does not increaſe, yet does not diminiſh the beauty of either, conſidered as a ſeparate and unconnected object. But the exact reſemblance of two productions of art, ſeems to be always conſidered as ſome diminution of the merit of at leaſt one of them; as it ſeems to prove, that one of them, at leaſt, is a copy either of the other, or of ſome other original. One may ſay, even of the copy of a picture, that it derives its merit, not ſo much from its reſemblance to the original, as from its reſemblance to the object which the original was meant to reſemble. The owner of the copy, ſo far from ſetting any high value upon its reſemblance to the original, is often anxious to deſtroy any value or merit which it might derive from this circumſtance. He is often anxious to perſuade both himſelf and other people that it is not a copy, but an original, of which

which what paſſes for the original is only a copy. But, whatever merit a copy may derive from its reſemblance to the original, an original can certainly derive none from the reſemblance of its copy.

But though a production of art ſeldom derives any merit from its reſemblance to another object of the ſame kind, it frequently derives a great deal from its reſemblance to an object of a different kind, whether that object be a production of art or of nature. A painted cloth, the work of ſome laborious Dutch artiſt, ſo curiouſly ſhaded and coloured as to repreſent the pile and ſoftneſs of a woollen one, might derive ſome merit from its reſemblance even to the ſorry carpet which now lies before me. The copy might, and probably would, in this caſe, be of much greater value than the original. But if this carpet was repreſented as ſpread, either upon a floor or upon a table, and projecting from the back ground of the picture, with exact obſervation of perſpective, and of light and ſhade, the merit of the imitation would be ſtill greater.

In Painting, a plain ſurface of one kind is made to reſemble, not only a plain ſurface of another, but all the three dimenſions of a ſolid ſubſtance. In Statuary and Sculpture, a ſolid ſubſtance of one kind, is made to reſemble a ſolid ſubſtance of another. The diſparity between the object imitating, and the object imitated, is much greater in the one art than in the other; and the pleaſure ariſing from the imitation ſeems to be greater in proportion as this diſparity is greater.

In Painting, the imitation frequently pleaſes, though the original object be indifferent, or even offenſive. In Statuary and Sculpture it is otherwiſe. The imitation ſeldom pleaſes, unleſs the original ob-

ject be in a very high degree either great, or beautiful, or intereſting. A butcher's ſtall, or a kitchen-dreſſer, with the objects which they commonly preſent, are not certainly the happieſt ſubjects, even for Painting. They have, however, been repreſented with ſo much care and ſucceſs by ſome Dutch maſters, that it is impoſſible to view the pictures without ſome degree of pleaſure. They would be moſt abſurd ſubjects for Statuary or Sculpture, which are, however, capable of repreſenting them. The picture of a very ugly or deformed man, ſuch as Æſop, or Scarron, might not make a diſagreeable piece of furniture. The ſtatue certainly would. Even a vulgar ordinary man or woman, engaged in a vulgar ordinary action, like what we ſee with ſo much pleaſure in the pictures of Rembrant, would be too mean a ſubject for Statuary. Jupiter, Hercules, and Apollo, Venus and Diana, the Nymphs and the Graces, Bacchus, Mercury, Antinous and Meleager, the miſerable death of Laocoon, the melancholy fate of the children of Niobe, the Wreſtlers, the fighting, the dying gladiator, the figures of gods and goddeſſes, of heroes and heroines, the moſt perfect forms of the human body, placed either in the nobleſt attitudes, or in the moſt intereſting ſituations which the human imagination is capable of conceiving, are the proper, and therefore have always been the favourite ſubjects of Statuary: that art cannot, without degrading itſelf, ſtoop to repreſent any thing that is offenſive, or mean, or even indifferent. Painting is not ſo diſdainful; and, though capable of repreſenting the nobleſt objects, it can, without forfeiting its title to pleaſe, ſubmit to imitate thoſe of a much more humble nature. The merit of the imitation alone, and without any merit in the imitated object, is capable of ſupporting the dignity of Painting: it cannot ſupport that of Statuary. There would ſeem, therefore, to be more merit in the one ſpecies of imitation than in the other

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In Statuary, ſcarcely any drapery is agreeable. The beſt of the ancient ſtatues were either altogether naked or almoſt naked; and thoſe of which any conſiderable part of the body is covered, are repreſented as clothed in wet linen—a ſpecies of clothing which moſt certainly never was agreeable to the faſhion of any country. This drapery too is drawn ſo tight, as to expreſs beneath its narrow foldings the exact form and outline of any limb, and almoſt of every muſcle of the body. The clothing which thus approached the neareſt to no clothing at all, had, it ſeems, in the judgment of the great artiſts of antiquity, been that which was moſt ſuitable to Statuary. A great painter of the Roman ſchool, who had formed his manner almoſt entirely upon the ſtudy of the ancient ſtatues, imitated at firſt their drapery in his pictures; but he ſoon found that in Painting it had the air of meanneſs and poverty, as if the perſons who wore it could ſcarce afford clothes enough to cover them; and that larger folds, and a looſer and more flowing drapery, were more ſuitable to the nature of his art. In Painting, the imitation of ſo very inferior an object as a ſuit of clothes is capable of pleaſing; and, in order to give this object all the magnificence of which it is capable, it is neceſſary that the folds ſhould be large, looſe, and flowing. It is not neceſſary in Painting that the exact form and outline of every limb, and almoſt of every muſcle of the body, ſhould be expreſſed beneath the folds of the drapery; it is ſufficient if theſe are ſo diſpoſed as to indicate in general the ſituation and attitude of the principal limbs. Painting, by the mere force and merit of its imitation, can venture, without the hazard of diſpleaſing, to ſubſtitute, upon many occaſions, the inferior in the room of the ſuperior object, by making the one, in this manner, cover and entirely conceal a great part of the other. Statuary can ſeldom venture to do this, but with the utmoſt reſerve and caution; and the ſame drapery, which is noble and magnificent in the one

art, appears clumſy and awkward in the other. Some modern artiſts, however, have attempted to introduce into Statuary the drapery which is peculiar to Painting. It may not, perhaps, upon every occaſion, be quite ſo ridiculous as the marble periwigs in Weſtminſter Abbey: but, if it does not always appear clumſy and awkward, it is at beſt always inſipid and unintereſting.

It is not the want of colouring which hinders many things from pleaſing in Statuary, which pleaſe in Painting; it is the want of that degree of diſparity between the imitating and the imitated object, which is neceſſary, in order to render intereſting the imitation of an object which is itſelf not intereſting. Colouring, when added to Statuary, ſo far from increaſing, deſtroys almoſt entirely the pleaſure which we receive from the imitation; becauſe it takes away the great ſource of that pleaſure, the diſparity between the imitating and the imitated object. That one ſolid and coloured object ſhould exactly reſemble another ſolid and coloured object, ſeems to be a matter of no great wonder or admiration. A painted ſtatue, though it certainly may reſemble a human figure much more exactly than any ſtatue which is not painted, is generally acknowledged to be a diſagreeable, and even an offenſive object; and ſo far are we from being pleaſed with this ſuperior likeneſs, that we are never ſatisfied with it; and, after viewing it again and again, we always find that it is not equal to what we are diſpoſed to imagine it might have been: though it ſhould ſeem to want ſcarce any thing but the life, we could not pardon it for thus wanting what it is altogether impoſſible it ſhould have. The works of Mrs. Wright, a ſelf-taught artiſt of great merit, are perhaps more perfect in this way than any thing I have ever ſeen. They do admirably well to be ſeen now and then as a ſhow; but the beſt of them we ſhould find, if brought home to our own houſe, and placed in a ſituation where it was to come often into view, would make,

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inſtead of an ornamental, a moſt offenſive piece of houſehold furniture. Painted ſtatues, accordingly, are univerſally reprobated, and we ſcarce ever meet with them. To colour the eyes of ſtatues is not altogether ſo uncommon: even this, however, is diſapproved by all good judges. "I cannot bear it," (a gentleman uſed to ſay, of great knowledge and judgment in this art,) "I cannot bear it; I always "want them to ſpeak to me."

Artificial fruits and flowers ſometimes imitate ſo exactly the natural objects which they repreſent, that they frequently deceive us. We ſoon grow weary of them, however; and, though they ſeem to want nothing but the freſhneſs and the flavour of natural fruits and flowers, we cannot pardon them, in the ſame manner, for thus wanting what it is altogether impoſſible they ſhould have. But we do not grow weary of a good flower and fruit painting. We do not grow weary of the foliage of the Corinthian capital, or of the flowers which ſometimes ornament the frize of that order. Such imitations, however, never deceive us; their reſemblance to the original objects is always much inferior to that of artificial fruits and flowers. Such as it is, however, we are contented with it; and, where there is ſuch diſparity between the imitating and the imitated objects, we find that it is as great as it can be, or as we expect that it ſhould be. Paint that foliage and thoſe flowers with the natural colours, and, inſtead of pleaſing more, they will pleaſe much leſs. The reſemblance, however, will be much greater; but the diſparity between the imitating and the imitated objects will be ſo much leſs, that even this ſuperior reſemblance will not ſatisfy us. Where the diſparity is very great, on the contrary, we are often contented with the moſt imperfect reſemblance; with the very imperfect reſemblance, for example, both as to figure and colour, of fruits and flowers in ſhell-work.

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It may be obſerved, however, that, though in Sculpture the imitation of flowers and foliage pleaſes as an ornament of architecture, as a part of the dreſs which is to ſet off the beauty of a different and a more important object, it would not pleaſe alone, or as a ſeparate and unconnected object, in the ſame manner as a fruit and flower painting pleaſes. Flowers and foliage, how elegant and beautiful ſoever, are not ſufficiently intereſting; they have not dignity enough, if I may ſay ſo, to be proper ſubjects for a piece of Sculpture, which is to pleaſe alone, and not as the ornamental appendage of ſome other object.

In Tapeſtry and Needle-work, in the ſame manner as in Painting, a plain ſurface is ſometimes made to repreſent all the three dimenſions of a ſolid ſubſtance. But both the ſhuttle of the weaver, and the needle of the embroiderer, are inſtruments of imitation ſo much inferior to the pencil of the painter, that we are not ſurpriſed to find a proportionable inferiority in their productions. We have all more or leſs experience that they uſually are much inferior; and, in appreciating a piece of Tapeſtry or Needle-work, we never compare the imitation of either with that of a good picture, for it never could ſtand that compariſon, but with that of other pieces of Tapeſtry or Needle-work. We take into conſideration, not only the diſparity between the imitating and the imitated object, but the awkwardneſs of the inſtruments of imitation; and if it is as well as any thing that can be expected from theſe, if it is better than the greater part of what actually comes from them, we are often not only contented but highly pleaſed.

A good painter will often execute in a few days a ſubject which would employ the beſt tapeſtry-weaver for many years; though, in proportion to his time, therefore, the latter is always much worſe paid

paid than the former, yet his work in the end comes commonly much dearer to market. The great expence of good Tapeſtry, the circumſtance which confines it to the palaces of princes and great lords, gives it, in the eyes of the greater part of people, an air of riches and magnificence, which contributes ſtill further to compenſate the imperfection of its imitation. In arts which addreſs themſelves, not to the prudent and the wiſe, but to the rich and the great, to the proud and the vain, we ought not to wonder if the appearance of great expence, of being what few people can purchaſe, of being one of the ſureſt characteriſtics of great fortune, ſhould often ſtand in the place of exquiſite beauty, and contribute equally to recommend their productions. As the idea of expence ſeems often to embelliſh, ſo that of cheapneſs ſeems as frequently to tarniſh the luſtre even of very agreeable objects. The difference between real and falſe jewels is what even the experienced eye of a jeweller can ſometimes with difficulty diſtinguiſh. Let an unknown lady, however, come into a public aſſembly, with a head-dreſs which appears to be very richly adorned with diamonds, and let a jeweller only whiſper in our ear that they are all falſe ſtones, not only the lady will immediately ſink in our imagination from the rank of a princeſs to that of a very ordinary woman, but the head-dreſs, from an object of the moſt ſplendid magnificence, will at once become an impertinent piece of tawdry and tinſel finery.

It was ſome years ago the faſhion to ornament a garden with yew and holly trees, clipped into the artificial ſhapes of pyramids, and columns, and vaſes, and obeliſks. It is now the faſhion to ridicule this taſte as unnatural. The figure of a pyramid or obeliſk, however, is not more unnatural to a yew-tree than to a block of porphyry or marble. When the yew-tree is preſented to the eye in this artificial ſhape, the gardener does not mean that it ſhould be underſtood

ſtood to have grown in that ſhape: he means, firſt, to give it the ſame beauty of regular figure, which pleaſes ſo much in porphyry and marble; and, ſecondly, to imitate in a growing tree the ornaments of thoſe precious materials: he means to make an object of one kind reſemble another object of a very different kind; and to the original beauty of figure to join the relative beauty of imitation: but the diſparity between the imitating and the imitated object is the foundation of the beauty of imitation. It is becauſe the one object does not naturally reſemble the other, that we are ſo much pleaſed with it, when by art it is made to do ſo. The ſhears of the gardener, it may be ſaid, indeed, are very clumſy inſtruments of Sculpture. They are ſo, no doubt, when employed to imitate the figures of men, or even of animals. But in the ſimple and regular forms of pyramids, vaſes, and obeliſks, even the ſhears of the gardener do well enough. Some allowance too is naturally made for the neceſſary imperfection of the inſtrument, in the ſame manner as in Tapeſtry and Needle-work. In ſhort, the next time you have an opportunity of ſurveying thoſe out-of-faſhion ornaments, endeavour only to let yourſelf alone, and to reſtrain for a few minutes the fooliſh paſſion for playing the critic, and you will be ſenſible that they are not without ſome degree of beauty; that they give the air of neatneſs and correct culture at leaſt to the whole garden; and that they are not unlike what the "retired leiſure, that" (as Milton ſays) "in trim gardens takes his pleaſure," might be amuſed with. What then, it may be ſaid, has brought them into ſuch univerſal diſrepute among us? In a pyramid or obeliſk of marble, we know that the materials are expenſive, and that the labour which wrought them into that ſhape muſt have been ſtill more ſo. In a pyramid or obeliſk of yew, we know that the materials could coſt very little, and the labour ſtill leſs. The former are ennobled by their expence; the latter degraded by their cheapneſs. In the cabbage-garden

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of a tallow-chandler we may ſometimes perhaps have ſeen as many columns and vaſes, and other ornaments in yew, as there are in marble and porphyry at Verſailles: it is this vulgarity which has diſgraced them. The rich and the great, the proud and the vain, will not admit into the [1]gardens an ornament which the meaneſt of the people can have as well as they. The taſte for theſe ornaments came originally from France; where, notwithſtanding that inconſtancy of faſhion with which we ſometimes reproach the natives of that country, it ſtill continues in good repute. In France, the condition of the inferior ranks of people is ſeldom ſo happy as it frequently is in England; and you will there ſeldom find even pyramids and obeliſks of yew in the garden of a tallow-chandler. Such ornaments, not having in that country been degraded by their vulgarity, have not yet been excluded from the gardens of princes and great lords.

The works of the great maſters in Statuary and Painting, it is to be obſerved, never produce their effect by deception. They never are, and it never is intended that they ſhould be miſtaken for the real objects which they repreſent. Painted Statuary may ſometimes deceive an inattentive eye: proper Statuary never does. The little pieces of perſpective in Painting, which it is intended ſhould pleaſe by deception, repreſent always ſome very ſimple, as well as inſignificant, object; a roll of paper, for example, or the ſteps of a ſtaircaſe, in the dark corner of ſome paſſage or gallery. They are generally the works too of ſome very inferior artiſts. After being ſeen once, and producing the little ſurpriſe which it is meant they ſhould excite, together with the mirth which commonly accompanies it, they never pleaſe more, but appear ever after inſipid and tireſome.

The proper pleaſure which we derive from thoſe two imitative arts, ſo far from being the effect of deception, is altogether incom-

patible with it. That pleaſure is founded altogether upon our wonder at ſeeing an object of one kind repreſent ſo well an object of a very different kind, and upon our admiration of the art which ſurmounts ſo happily that diſparity which Nature had eſtabliſhed between them. The nobler works of Statuary and Painting appear to us a ſort of wonderful phænomena, differing in this reſpect from the wonderful phænomena of Nature, that they carry, as it were, their own explication along with them, and demonſtrate, even to the eye, the way and manner in which they are produced. The eye, even of an unſkilful ſpectator, immediately diſcerns, in ſome meaſure, how it is that a certain modification of figure in Statuary, and of brighter and darker colours in Painting, can repreſent, with ſo much truth and vivacity, the actions, paſſions, and behaviour of men, as well as a great variety of other objects. The pleaſing wonder of ignorance is accompanied with the ſtill more pleaſing ſatisfaction of ſcience. We wonder and are amazed at the effect; and we are pleaſed ourſelves, and happy to find that we can comprehend, in ſome meaſure, how that wonderful effect is produced.

A good looking-glaſs repreſents the objects which are ſet before it with much more truth and vivacity than either Statuary or Painting. But, though the ſcience of optics may explain to the underſtanding, the looking-glaſs itſelf does not at all demonſtrate to the eye how this effect is brought about. It may excite the wonder of ignorance; and in a clown, who had never beheld a looking-glaſs before, I have ſeen that wonder riſe almoſt to rapture and extaſy; but it cannot give the ſatisfaction of ſcience. In all looking-glaſſes the effects are produced by the ſame means, applied exactly in the ſame manner. In every different ſtatue and picture the effects are produced; though by ſimilar, yet not by the ſame means; and thoſe means too are applied in a different manner in each. Every good ſtatue and picture is a freſh wonder, which at the ſame time carries,

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in ſome meaſure, its own explication along with it. After a little uſe and experience, all looking-glaſſes ceaſe to be wonders altogether; and even the ignorant become ſo familiar with them, as not to think that their effects require any explication. A looking-glaſs, beſides, can repreſent only preſent objects; and, when the wonder is once fairly over, we chooſe, in all caſes, rather to contemplate the ſubſtance than to gaze at the ſhadow. One's own face becomes then the moſt agreeable object which a looking-glaſs can repreſent to us, and the only object which we do not ſoon grow weary with looking at; it is the only preſent object of which we can ſee only the ſhadow: whether handſome or ugly, whether old or young, it is the face of a friend always, of which the features correſpond exactly with whatever ſentiment, emotion, or paſſion we may happen at that moment to feel.

In Statuary, the means by which the wonderful effect is brought about appear more ſimple and obvious than in Painting; where the diſparity between the imitating and the imitated object being much greater, the art which can conquer that greater diſparity appears evidently, and almoſt to the eye, to be founded upon a much deeper ſcience, or upon principles much more abſtruſe and profound. Even in the meaneſt ſubjects we can often trace with pleaſure the ingenious means by which Painting ſurmounts this diſparity. But we cannot do this in Statuary, becauſe the diſparity not being ſo great, the means do not appear ſo ingenious. And it is upon this account, that in Painting we are often delighted with the repreſentation of many things, which in Statuary would appear inſipid, tireſome, and not worth the looking at.

It ought to be obſerved, however, that though in Statuary the art of imitation appears, in many reſpects, inferior to what it is in

Painting, yet, in a room ornamented with both ſtatues and pictures of nearly equal merit, we ſhall generally find that the ſtatues draw off our eye from the pictures. There is generally but one, or little more than one, point of view from which a picture can be ſeen with advantage, and it always preſents to the eye preciſely the ſame object. There are many different points of view from which a ſtatue may be ſeen with equal advantage, and from each it preſents a different object. There is more variety in the pleaſure which we receive from a good ſtatue, than in that which we receive from a good picture; and one ſtatue may frequently be the ſubject of many good pictures or drawings, all different from one another. The ſhadowy relief and projection of a picture, beſides, is much flattened, and ſeems almoſt to vaniſh away altogether, when brought into compariſon with the real and ſolid body which ſtands by it. How nearly ſoever theſe two arts may ſeem to be a-kin, they accord ſo very ill with one another, that their different productions ought, perhaps, ſcarce ever to be ſeen together.

PART II.

AFTER the pleaſures which ariſe from the gratification of the bodily appetites, there ſeem to be none more natural to man than Muſic and Dancing. In the progreſs of art and improvement they are, perhaps, the firſt and earlieſt pleaſures of his own invention; for thoſe which ariſe from the gratification of the bodily appetites cannot be ſaid to be of his own invention. No nation has yet been diſcovered ſo uncivilized as to be altogether without them. *It* ſeems

ſeems even to be amongſt the moſt barbarous nations that the uſe and practice of them is both moſt frequent and moſt univerſal, as among the negroes of Africa and the ſavage tribes of America. In civilized nations, the inferior ranks of people have very little leiſure, and the ſuperior ranks have many other amuſements; neither the one nor the other, therefore, can ſpend much of their time in Muſic and Dancing. Among ſavage nations, the great body of the people have frequently great intervals of leiſure, and they have ſcarce any other amuſement; they naturally, therefore, ſpend a great part of their time in almoſt the only one they have.

What the ancients called Rhythmus, what we call Time or Meaſure, is the connecting principle of thoſe two arts; Muſic conſiſting in a ſucceſſion of a certain ſort of ſounds, and Dancing in a ſucceſſion of a certain ſort of ſteps, geſtures, and motions, regulated according to time or meaſure, and thereby formed into a ſort of whole or ſyſtem; which in the one art is called a ſong or tune, and in the other a dance; the time or meaſure of the dance correſponding always exactly with that of the ſong or tune which accompanies and directs it *.

The human voice, as it is always the beſt, ſo it would naturally be the firſt and earlieſt of all muſical inſtruments: in ſinging, or in its firſt attempts towards ſinging, it would naturally employ ſounds as ſimilar as poſſible to thoſe which it had been accuſtomed to; that is, it would employ words of ſome kind or other, pronouncing them only in time and meaſure, and generally with a more melodious tone than had been uſual in common converſation. Thoſe words, however, might not, and probably would not, for a long time have any meaning, but might reſemble the ſyllables which we make uſe of in

* The Author's Obſervations on the Affinity between Muſic, Dancing, and Poetry, are annexed to the end of Part III. of this Eſſay.

fol-faing,

ſol-faing, or the *derry-down-down* of our common ballads; and ſerve only to aſſiſt the voice in forming ſounds proper to be modulated into melody, and to be lengthened or ſhortened according to the time and meaſure of the tune. This rude form of vocal Muſic, as it is by far the moſt ſimple and obvious, ſo it naturally would be the firſt and earlieſt.

In the ſucceſſion of ages it could not fail to occur, that in the room of thoſe unmeaning or muſical words, if I may call them ſo, might be ſubſtituted words which expreſſed ſome ſenſe or meaning, and of which the pronunciation might coincide as exactly with the time and meaſure of the tune, as that of the muſical words had done before. Hence the origin of Verſe or Poetry. The Verſe would for a long time be rude and imperfect. When the meaning words fell ſhort of the meaſure required, they would frequently be eked out with the unmeaning ones, as is ſometimes done in our common ballads. When the public ear came to be ſo refined as to reject, in all ſerious Poetry, the unmeaning words altogether, there would ſtill be a liberty aſſumed of altering and corrupting, upon many occaſions, the pronunciation of the meaning ones, for the ſake of accommodating them to the meaſure. The ſyllables which compoſed them would, for this purpoſe, ſometimes be improperly lengthened, and ſometimes improperly ſhortened; and though no unmeaning words were made uſe of, yet an unmeaning ſyllable would ſometimes be ſtuck to the beginning, to the end, or into the middle of a word. All theſe expedients we find frequently employed in the verſes even of Chaucer, the father of the Engliſh Poetry. Many ages might paſs away before verſe was commonly compoſed with ſuch correctneſs, that the uſual and proper pronunciation of the words alone, and without any other artifice, ſubjected the voice to the obſervation of a time and meaſure, of the ſame kind with the time and meaſure of Muſic.

The Verſe would naturally expreſs ſome ſenſe which ſuited the grave or gay, the joyous or melancholy humour of the tune which it was ſung to; being as it were blended and united with that tune, it would ſeem to give ſenſe and meaning to what otherwiſe might not appear to have any, or at leaſt any which could be clearly and diſtinctly underſtood, without the accompaniment of ſuch an explication.

A pantomime dance may frequently anſwer the ſame purpoſe, and, by repreſenting ſome adventure in love or war, may ſeem to give ſenſe and meaning to a Muſic which might not otherwiſe appear to have any. It is more natural to mimic, by geſtures and motions, the adventures of common life, than to expreſs them in Verſe or Poetry. The thought itſelf is more obvious, and the execution is much more eaſy. If this mimicry was accompanied by muſic, it would of its own accord, and almoſt without any intention of doing ſo, accommodate, in ſome meaſure, its different ſteps and movements to the time and meaſure of the tune; eſpecially if the ſame perſon both ſung the tune and performed the mimicry, as is ſaid to be frequently the caſe among the ſavage nations of Africa and America. Pantomime Dancing might in this manner ſerve to give a diſtinct ſenſe and meaning to Muſic many ages before the invention, or at leaſt before the common uſe of Poetry. We hear little, accordingly, of the Poetry of the ſavage nations of Africa and America, but a great deal of their pantomime dances.

Poetry, however, is capable of expreſſing many things fully and diſtinctly, which Dancing either cannot repreſent at all, or can repreſent but obſcurely and imperfectly; ſuch as the reaſonings and judgments of the underſtanding; the ideas, fancies, and ſuſpicions of the imagination; the ſentiments, emotions, and paſſions of the heart.

heart. In the power of expreſſing a meaning with clearneſs and diſtinctneſs, Dancing is ſuperior to Muſic, and Poetry to Dancing.

Of thoſe three Siſter Arts, which originally, perhaps, went always together, and which at all times go frequently together, there are two which can ſubſiſt alone, and ſeparate from their natural companions, and one which cannot. In the diſtinct obſervation of what the ancients called Rhythmus, of what we call Time and Meaſure, conſiſts the eſſence both of Dancing and of Poetry or Verſe; or the characteriſtical quality which diſtinguiſhes the former from all other motion and action, and the latter from all other diſcourſe. But, concerning the proportion between thoſe intervals and diviſions of duration which conſtitute what is called time and meaſure, the ear, it would ſeem, can judge with much more preciſion than the eye; and Poetry, in the ſame manner as Muſic, addreſſes itſelf to the ear, whereas Dancing addreſſes itſelf to the eye. In Dancing, the rhythmus, the proper proportion, the time and meaſure of its motions, cannot diſtinctly be perceived, unleſs they are marked by the more diſtinct time and meaſure of Muſic. It is otherwiſe in Poetry; no accompaniment is neceſſary to mark the meaſure of good Verſe. Muſic and Poetry, therefore, can each of them ſubſiſt alone; Dancing always requires the accompaniment of Muſic.

It is Inſtrumental Muſic which can beſt ſubſiſt apart, and ſeparate from both Poetry and Dancing. Vocal Muſic, though it may, and frequently does, conſiſt of notes which have no diſtinct ſenſe or meaning, yet naturally calls for the ſupport of Poetry. But "Muſic, married to immortal Verſe," as Milton ſays, or even to words of any kind which have a diſtinct ſenſe or meaning, is neceſſarily and eſſentially imitative. Whatever be the meaning of thoſe words, though, like many of the ſongs of ancient Greece, as well

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as ſome of thoſe of more modern times, they may expreſs merely ſome maxims of prudence and morality, or may contain merely the ſimple narrative of ſome important event, yet even in ſuch didactic and hiſtorical ſongs there will ſtill be imitation; there will ſtill be a thing of one kind, which by art is made to reſemble a thing of a very different kind; there will ſtill be Muſic imitating diſcourſe; there will ſtill be rhythmus and melody, ſhaped and faſhioned into the form either of a good moral counſel, or of an amuſing and intereſting ſtory.

In this firſt ſpecies of imitation, which being eſſential to, is therefore inſeparable from, all ſuch Vocal Muſic, there may, and there commonly is, added a ſecond. The words may, and commonly do, expreſs the ſituation of ſome particular perſon, and all the ſentiments and paſſions which he feels from that ſituation. It is a joyous companion who gives vent to the gaiety and mirth with which wine, feſtivity, and good company inſpire him. It is a lover who complains, or hopes, or fears, or deſpairs. It is a generous man who expreſſes either his gratitude for the favours, or his indignation at the injuries, which may have been done to him. It is a warrior who prepares himſelf to confront danger, and who provokes or defies his enemy. It is a perſon in proſperity who humbly returns thanks for the goodneſs, or one in affliction who with contrition implores the mercy and forgiveneſs, of that inviſible Power to whom he looks up as the Director of all the events of human life. The ſituation may comprehend, not only one, but two, three, or more perſons; it may excite in them all either ſimilar or oppoſite ſentiments; what is a ſubject of ſorrow to one, being an occaſion of joy and triumph to another; and they may all expreſs, ſometimes ſeparately and ſometimes together, the particular way in which each of them is affected, as in a duo, trio, or a chorus.

All this it may, and it frequently has been ſaid is unnatural; nothing being more ſo, than to ſing when we are anxious to perſuade, or in earneſt to expreſs any very ſerious purpoſe. But it ſhould be remembered, that to make a thing of one kind reſemble another thing of a very different kind, is the very circumſtance which, in all the Imitative Arts, conſtitutes the merits of imitation; and that to ſhape, and as it were to bend, the meaſure and the melody of Muſic, ſo as to imitate the tone and the language of counſel and converſation, the accent and the ſtyle of emotion and paſſion, is to make a thing of one kind reſemble another thing of a very different kind.

The tone and the movements of Muſic, though naturally very different from thoſe of converſation and paſſion, may, however, be ſo managed as to ſeem to reſemble them. On account of the great diſparity between the imitating and the imitated object, the mind in this, as in the other caſes, cannot only be contented, but delighted, and even charmed and tranſported, with ſuch an imperfect reſemblance as can be had. Such imitative Muſic, therefore, when ſung to words which explain and determine its meaning, may frequently appear to be a very perfect imitation. It is upon this account, that even the incomplete Muſic of a recitative ſeems to expreſs ſometimes all the ſedateneſs and compoſure of ſerious but calm diſcourſe, and ſometimes all the exquiſite ſenſibility of the moſt intereſting paſſion. The more complete Muſic of an air is ſtill ſuperior, and, in the imitation of the more animated paſſions, has one great advantage over every ſort of diſcourſe, whether Proſe or Poetry, which is not ſung to Muſic. In a perſon who is either much depreſſed by grief or enlivened by joy, who is ſtrongly affected either with love or hatred, with gratitude or reſentment, with admiration or contempt, there is commonly one thought or idea which dwells upon his mind, which continually

tinually haunts him, which, when he has chaced it away, immediately returns upon him, and which in company makes him abſent and inattentive. He can think but of one object, and he cannot repeat to them that object ſo frequently as it recurs upon him. He takes refuge in ſolitude, where he can with freedom either indulge the extaſy or give way to the agony of the agreeable or diſagreeable paſſion which agitates him; and where he can repeat to himſelf, which he does ſometimes mentally, and ſometimes even aloud, and almoſt always in the ſame words, the particular thought which either delights or diſtreſſes him. Neither Proſe nor Poetry can venture to imitate thoſe almoſt endleſs repetitions of paſſion. They may deſcribe them as I do now, but they dare not imitate them; they would become moſt inſufferably tireſome if they did. The Muſic of a paſſionate air not only may, but frequently does, imitate them; and it never makes its way ſo directly or ſo irreſiſtibly to the heart as when it does ſo. It is upon this account that the words of an air, eſpecially of a paſſionate one, though they are ſeldom very long, yet are ſcarce ever ſung ſtraight on to the end, like thoſe of a recitative; but are *almoſt always* broken into parts, which are tranſpoſed and repeated again and again, according to the fancy or judgment of the compoſer. It is by means of ſuch repetitions only, that Muſic can exert thoſe peculiar powers of imitation which diſtinguiſh it, and in which it excels all the other Imitative Arts. Poetry and Eloquence, it has accordingly been often obſerved, produce their effect always by a connected variety and ſucceſſion of different thoughts and ideas: but Muſic frequently produces its effects by a repetition of the ſame idea; and the ſame ſenſe expreſſed in the ſame, or nearly the ſame, combination of ſounds, though at firſt perhaps it may make ſcarce any impreſſion upon us, yet, by being repeated again and again, it comes at laſt gradually, and by little and little, to move, to agitate, and to tranſport us.

To theſe powers of imitating, Muſic naturally, or rather neceſſarily, joins the happieſt choice in the objects of its imitation. The ſentiments and paſſions which Muſic can beſt imitate are thoſe which unite and bind men together in ſociety; the ſocial, the decent, the virtuous, the intereſting and affecting, the amiable and agreeable, the awful and reſpectable, the noble, elevating, and commanding paſſions. Grief and diſtreſs are intereſting and affecting; humanity and compaſſion, joy and admiration, are amiable and agreeable; devotion is awful and reſpectable; the generous contempt of danger, the honourable indignation at injuſtice, are noble, elevating, and commanding. But it is theſe and ſuch like paſſions which Muſic is fitteſt for imitating, and which it in fact moſt frequently imitates. They are, if I may ſay ſo, all Muſical Paſſions; their natural tones are all clear, diſtinct, and almoſt melodious; and they naturally expreſs themſelves in a language which is diſtinguiſhed by pauſes at regular, and almoſt equal, intervals; and which, upon that accouſt, can more eaſily be adapted to the regular returns of the correſpondent periods of a tune. The paſſions, on the contrary, which drive men from one another, the *unſocial*, the *hateful*, the indecent, the vicious paſſions, cannot eaſily be imitated by Muſic. The voice of furious anger, for example, is harſh and diſcordant; its periods are all irregular, ſometimes very long and ſometimes very ſhort, and diſtinguiſhed by no regular pauſes. The obſcure and almoſt inarticulate grumblings of black malice and envy, the ſcreaming outcries of daſtardly fear, the hideous growlings of brutal and implacable revenge, are all equally diſcordant. It is with difficulty that Muſic can imitate any of thoſe paſſions, and the Muſic which does imitate them is not the moſt agreeable. A whole entertainment may conſiſt, without any impropriety, of the imitation of the ſocial and amiable paſſions. It would be a ſtrange entertainment which conſiſted altogether in the imitation of the odious and the vicious.

A ſingle

A ſingle ſong expreſſes almoſt always ſome ſocial, agreeable, or intereſting paſſion. In an opera the unſocial and diſagreeable are ſometimes introduced, but it is rarely, and as diſcords are introduced into harmony, to ſet off by their contraſt the ſuperior beauty of the oppoſite paſſions. What Plato ſaid of Virtue, that it was of all beauties the brighteſt, may with ſome ſort of truth be ſaid of the proper and natural objects of muſical imitation. They are either the ſentiments and paſſions, in the exerciſe of which conſiſt both the glory and the happineſs of human life, or they are thoſe from which it derives its moſt delicious pleaſures, and moſt enlivening joys; or, at the worſt and the loweſt, they are thoſe by which it calls upon our indulgence and compaſſionate aſſiſtance to its unavoidable weakneſſes, its diſtreſſes, and its misfortunes.

To the merit of its imitation and to that of its happy choice in the objects which it imitates, the great merits of Statuary and Painting, Muſic joins another peculiar and exquiſite merit of its own. Statuary and Painting cannot be ſaid to add any new beauties of their own to the beauties of Nature which they imitate; they may aſſemble a greater number of thoſe beauties, and group them in a more agreeable manner than they are commonly, or perhaps ever, to be found in Nature. It may perhaps be true, what the artiſts are ſo very fond of telling us, that no woman ever equalled, in all the parts of her body, the beauty of the Venus of Medicis, nor any man that of the Apollo of Belvidere. But they muſt allow, ſurely, that there is no particular beauty in any part or feature of thoſe two famous ſtatues, which is not at leaſt equalled, if not much excelled, by what is to be found in many living ſubjects. But Muſic, by arranging, and as it were bending to its own time and meaſure, whatever ſentiments and paſſions it expreſſes, not only aſſembles and groups, as well as Statuary and Painting, the different beauties of Nature which it imitates, but it clothes them, beſides, with a new

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and an exquiſite beauty of its own; it clothes them with melody and harmony, which, like a tranſparent mantle, far from concealing any beauty, ſerve only to give a brighter colour, a more enlivening luſtre, and a more engaging grace to every beauty which they infold.

To theſe two different ſorts of imitation,—to that general one, by which Muſic is made to reſemble diſcourſe, and to that particular one, by which it is made to expreſs the ſentiments and feelings with which a particular ſituation inſpires a particular perſon,—there is frequently joined a third. The perſon who ſings may join to this double imitation of the finger the additional imitation of the actor; and expreſs, not only by the modulation and cadence of his voice, but by his countenance, by his attitudes, by his geſtures, and by his motions, the ſentiments and feelings of the perſon whoſe ſituation is painted in the ſong. Even in private company, though a ſong may ſometimes perhaps be ſaid to be well ſung, it can never be ſaid to be well performed, unleſs the finger does ſomething of this kind; and there is no compariſon between the effect of what is ſung coldly from a muſic-book at the end of a harpſichord, and of what is not only ſung, but acted with proper freedom, animation, and boldneſs. An opera actor does no more than this; and an imitation which is ſo pleaſing, and which appears even ſo natural, in private ſociety, ought not to appear forced, unnatural, or diſagreeable upon the ſtage.

In a good opera actor, not only the modulations and pauſes of his voice, but every motion and geſture, every variation, either in the air of his head, or in the attitude of his body, correſpond to the time and meaſure of Muſic: they correſpond to the expreſſion of the ſentiment or paſſion which the Muſic imitates, and that expreſſion neceſſarily correſponds to this time and meaſure. Muſic is

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as it were the ſoul which animates him, which informs every feature of his countenance, and even directs every movement of his eyes. Like the muſical expreſſion of a ſong, his action adds to the natural grace of the ſentiment or action which it imitates, a new and peculiar grace of its own; the exquiſite and engaging grace of thoſe geſtures and motions, of thoſe airs and attitudes which are directed by the movement, by the time and meaſure of Muſic; this grace heightens and enlivens that expreſſion. Nothing can be more deeply affecting than the intereſting ſcenes of the ſerious opera, when to good Poetry and good Muſic, to the Poetry of Metaſtaſio and the Muſic of Pergoleſe, is added the execution of a good actor. In the ſerious opera, indeed, the action is too often ſacrificed to the Muſic; the caſtrati, who perform the principal parts, being always the moſt inſipid and miſerable actors. The ſprightly airs of the comic opera are, in the ſame manner, in the higheſt degree enlivening and diverting. Though they do not make us laugh ſo loud as we ſometimes do at the ſcenes of the common comedy, they make us ſmile more frequently; and the agreeable gaiety, the temperate joy, if I may call it ſo, with which they inſpire us, is not only an elegant, but a moſt delicious pleaſure. The deep diſtreſs and the great paſſions of tragedy are capable of producing ſome effect, though it ſhould be but indifferently acted. It is not ſo with the lighter misfortunes and leſs affecting ſituations of comedy: unleſs it is at leaſt tolerably acted, it is altogether inſupportable. But the caſtrati are ſcarce ever tolerable actors; they are accordingly ſeldom admitted to play in the comic opera; which, being upon that account commonly better performed than the ſerious, appears to many people the better entertainment of the two.

The imitative powers of Inſtrumental are much inferior to thoſe of Vocal Muſic; its melodious but unmeaning and inarticulated ſounds

ſounds cannot, like the articulations of the human voice, relate diſtinctly the circumſtances of any particular ſtory, or deſcribe the different ſituations which thoſe circumſtances produced; or even expreſs clearly, and ſo as to be underſtood by every hearer, the various ſentiments and paſſions which the parties concerned felt from theſe ſituations: even its imitation of other ſounds, the objects which it can certainly beſt imitate, is commonly ſo indiſtinct, that alone, and without any explication, it might not readily ſuggeſt to us what was the imitated object. The rocking of a cradle is ſuppoſed to be imitated in that concerto of Correlli, which is ſaid to have been compoſed for the Nativity: but, unleſs we were told beforehand, it might not readily occur to us what it meant to imitate, or whether it meant to imitate any thing at all; and this imitation (which, though perhaps as ſucceſsful as any other, is by no means the diſtinguiſhed beauty of that admired compoſition) might only appear to us a ſingular and odd paſſage in Muſic. The ringing of bells and the ſinging of the lark and nightingale are imitated in the ſymphony of Inſtrumental Muſic which Mr. Handel has compoſed for the Allegro and Penſeroſo of Milton: theſe are not only ſounds but muſical ſounds, and may therefore be ſuppoſed to be more within the compaſs of the powers of muſical imitation. *It is* accordingly univerſally acknowledged, that in theſe imitations this great maſter has been remarkably ſucceſsful; and yet, unleſs the verſes of Milton explained the meaning of the Muſic, it might not even in this caſe readily occur to us what it meant to imitate, or whether it meant to imitate any thing at all. With the explication of the words, indeed, the imitation appears, what it certainly is, a very fine one; but without that explication it might perhaps appear only a ſingular paſſage, which had leſs connexion either with what went before or with what came after it, than any other in the Muſic.

Inſtrumental Muſic is ſaid ſometimes to imitate motion; but in reality it only either imitates the particular ſounds which accompany certain motions, or it produces ſounds of which the time and meaſure bear ſome correſpondence to the variations, to the pauſes and interruptions, to the ſucceſſive accelerations and retardations of the motion which it means to imitate: it is in this way that it ſometimes attempts to expreſs the march and array of an army, the confuſion and hurry of a battle, &c. In all theſe caſes, however, its imitation is ſo very indiſtinct, that without the accompaniment of ſome other art, to explain and interpret its meaning, it would be almoſt always unintelligible; and we could ſcarce ever know with certainty, either what it meant to imitate, or whether it meant to imitate any thing at all.

In the imitative arts, though it is by no means neceſſary that the imitating ſhould ſo exactly reſemble the imitated object, that the one ſhould ſometimes be miſtaken for the other, it is, however, neceſſary that they ſhould reſemble at leaſt ſo far, that the one ſhould always readily ſuggeſt the other. It would be a ſtrange picture which required an inſcription at the foot to tell us, not only what particular perſon it meant to repreſent, but whether it meant to repreſent a man or a horſe, or whether it meant to be a picture at all, and to repreſent any thing. The imitations of inſtrumental Muſic may, in ſome reſpects, be ſaid to reſemble ſuch pictures. There is, however, this very eſſential difference between them, that the picture would not be much mended by the inſcription; whereas, by what may be conſidered as very little more than ſuch an inſcription, inſtrumental Muſic, though it cannot always even then, perhaps, be ſaid properly to imitate, may, however, produce all the effects of the fineſt and moſt perfect imitation. In order to explain in what manner this is brought about, it will not be neceſſary to deſcend into any great depth of philoſophical ſpeculation.

That train of thoughts and ideas which is continually paſſing through the mind does not always move on with the ſame pace, if I may ſay ſo, or with the ſame order and connection. When we are gay and cheerful, its motion is briſker and more lively, our thoughts ſucceed one another more rapidly, and thoſe which immediately follow one another ſeem frequently either to have but little connection, or to be connected rather by their oppoſition than by their mutual reſemblance. As in this wanton and playful diſpoſition of mind we hate to dwell long upon the ſame thought, ſo we do not much care to purſue reſembling thoughts; and the variety of contraſt is more agreeable to us than the ſameneſs of reſemblance. It is quite otherwiſe when we are melancholy and deſponding; we then frequently find ourſelves haunted, as it were, by ſome thought which we would gladly chaſe away, but which conſtantly purſues us, and which admits no followers, attendants, or companions, but ſuch as are of its own kindred and complexion. A ſlow ſucceſſion of reſembling or cloſely connected thoughts is the characteriſtic of this diſpoſition of mind; a quick ſucceſſion of thoughts, frequently contraſted and in general very ſlightly connected, is the characteriſtic of the other. What may be called the natural ſtate of the mind, the ſtate in which we are neither elated nor dejected, the ſtate of ſedateneſs, tranquillity, and compoſure, holds a ſort of middle place between thoſe two oppoſite extremes; our thoughts ſucceed one another more ſlowly, and with a more diſtinct connection, than in the one; more quickly, and with a greater variety, than in the other.

Acute ſounds are naturally gay, ſprightly, and enlivening; grave ſounds ſolemn, awful, and melancholy. There ſeems too to be ſome natural connection between acuteneſs in tune and quickneſs in time or ſucceſſion, as well as between gravity and ſloweſs: an acute ſound ſeems to fly off more quickly than a grave one: the treble is

more cheerful than the baſs; its notes likewiſe commonly ſucceed one another more rapidly. But inſtrumental Muſic, by a proper arrangement, by a quicker or ſlower ſucceſſion of acute and grave, of reſembling and contraſted ſounds, can not only accommodate itſelf to the gay, the ſedate, or the melancholy mood; but if the mind is ſo far vacant as not to be diſturbed by any diſorderly paſſion, it can, at leaſt for the moment, and to a certain degree, produce every poſſible modification of each of thoſe moods or diſpoſitions. We all readily diſtinguiſh the cheerful, the gay, and the ſprightly Muſic, from the melancholy, the plaintive, and the affecting; and both theſe from what holds a ſort of middle place between them, the ſedate, the tranquil, and the compoſing. And we are all ſenſible that, in the natural and ordinary ſtate of the mind, Muſic can, by a ſort of incantation, ſooth and charm us into ſome degree of that particular mood or diſpoſition which accords with its own character and temper. In a concert of inſtrumental Muſic the attention is engaged, with pleaſure and delight, to liſten to a combination of the moſt agreeable and melodious ſounds, which follow one another, ſometimes with a quicker, and ſometimes with a ſlower ſucceſſion; and in which thoſe that immediately follow one another ſometimes exactly or nearly reſemble, and ſometimes contraſt with one another in tune, in time, and in order of arrangement. The mind being thus ſucceſſively occupied by a train of objects, of which the nature, ſucceſſion, and connection correſpond, ſometimes to the gay, ſometimes to the tranquil, and ſometimes to the melancholy mood or diſpoſition, it is itſelf ſucceſſively led into each of thoſe moods or diſpoſitions; and is thus brought into a ſort of harmony or concord with the Muſic which ſo agreeably engages its attention.

It is not, however, by imitation properly, that inſtrumental Muſic produces this effect: inſtrumental Muſic does not imitate, as vocal

Muſic, as Painting, or as Dancing would imitate, a gay, a ſedate, or a melancholy perſon; it does not tell us, as any of thoſe other arts could tell us, a pleaſant, a ſerious, or a melancholy ſtory. It is not, as in vocal Muſic, in Painting, or in Dancing, by ſympathy with the gaiety, the ſedateneſs, or the melancholy and diſtreſs of ſome other perſon, that inſtrumental Muſic ſoothes us into each of theſe diſpoſitions: it becomes itſelf a gay, a ſedate, or a melancholy object; and the mind naturally aſſumes the mood or diſpoſition which at the time correſponds to the object which engages its attention. Whatever we feel from inſtrumental Muſic is an original, and not a ſympathetic feeling: it is our own gaiety, ſedateneſs, or melancholy; not the reflected diſpoſition of another perſon.

When we follow the winding alleys of ſome happily ſituated and well laid out garden, we are preſented with a ſucceſſion of landſcapes, which are ſometimes gay, ſometimes gloomy, and ſometimes calm and ſerene; if the mind is in its natural ſtate, it ſuits itſelf to the objects which ſucceſſively preſent themſelves, and varies in ſome degree its mood and preſent humour with every variation of the ſcene. It would be improper, however, to ſay that thoſe ſcenes imitated the gay, the calm, or the melancholy mood of the mind; they may produce in their turn each of thoſe moods, but they cannot imitate any of them. Inſtrumental Muſic, in the ſame manner, though it can excite all thoſe different diſpoſitions, cannot imitate any of them. There are no two things in nature more perfectly diſparate than ſound and ſentiment; and it is impoſſible by any human power to faſhion the one into any thing that bears any real reſemblance to the other.

This power of exciting and varying the different moods and diſpoſitions of the mind, which inſtrumental Muſic really poſſeſſes to a very conſiderable degree, has been the principal ſource of its reputation

putation for thoſe great imitative powers which have been aſcribed to it. "Painting," ſays an Author, more capable of feeling ſtrongly than of analiſing accurately, Mr. Rouſſeau of Geneva, "Painting, "which preſents its imitations, not to the imagination, but to the "ſenſes, and to only one of the ſenſes, can repreſent nothing be- "ſides the objects of ſight. Muſic, one might imagine, ſhould be "equally confined to thoſe of hearing. It imitates, however, every "thing, even thoſe objects which are perceivable by ſight only. "By a deluſion that ſeems almoſt inconceivable, it can, as it were, "put the eye into the ear; and the greateſt wonder, of an art which "acts only by motion and ſucceſſion, is, that it can imitate reſt and "repoſe. Night, Sleep, Solitude, and Silence are all within the "compaſs of muſical imitation. Though all Nature ſhould be aſleep, "the perſon who contemplates it is awake; and the art of the muſi- "cian conſiſts in ſubſtituting, in the room of an image of what is "not the object of hearing, that of the movements which its pre- "ſence would excite in the mind of the ſpectator."—That is, of the effects which it would produce upon his mood and diſpo- ſition. "The muſician (continues the ſame Author) will ſome- "times, not only agitate the waves of the ſea, blow up the flames "of a conflagration, make the rain fall, the rivulets flow and ſwell "the torrents, but he will paint the horrors of a hideous deſart, "darken the walls of a ſubterraneous dungeon, calm the tempeſt, "reſtore ſerenity and tranquillity to the air and the ſky, and ſhed "from the orcheſtre a new freſhneſs over the groves and the fields. "He will not directly repreſent any of theſe objects, but he will "excite in the mind the ſame movements which it would feel from "ſeeing them."

Upon this very eloquent deſcription of Mr. Rouſſeau I muſt ob- ſerve, that without the accompaniment of the ſcenery and action of the opera, without the aſſiſtance either of the ſcene-painter or of the

poet,

poet, or of both, the inſtrumental Muſic of the orcheſtre could produce none of the effects which are here aſcribed to it; and we could never know, we could never even gueſs, which of the gay, melancholy, or tranquil objects above-mentioned it meant to repreſent to us; or whether it meant to repreſent any of them, and not merely to entertain us with a concert of gay, melancholy, or tranquil Muſic; or, as the ancients called them, of the Diaſtaltic, of the Syſtaltic, or of the Middle Muſic. With that accompaniment, indeed, though it cannot always even then, perhaps, be ſaid properly to imitate, yet by ſupporting the imitation of ſome other art, it may produce all the ſame effects upon us as if itſelf had imitated in the fineſt and moſt perfect manner. Whatever be the object or ſituation which the ſcene-painter repreſents upon the theatre, the Muſic of the orcheſtre, by diſpoſing the mind to the ſame ſort of mood and temper which it would feel from the preſence of that object, or from ſympathy with the perſon who was placed in that ſituation, can greatly enhance the effect of that imitation: it can accommodate itſelf to every diverſity of ſcene. The melancholy of the man who, upon ſome great occaſion, only finds himſelf alone in the darkneſs, the ſilence and ſolitude of the night, is very different from that of one who, upon a like occaſion, finds himſelf in the midſt of ſome dreary and inhoſpitable deſert; and even in this ſituation his feelings would not be the ſame as if he was ſhut up in a ſubterraneous dungeon. The different degrees of preciſion with which the Muſic of the orcheſtre can accommodate itſelf to each of thoſe diverſities, muſt depend upon the taſte, the ſenſibility, the fancy and imagination of the compoſer: it may ſometimes, perhaps, contribute to this preciſion, that it ſhould imitate, as well as it can, the ſounds which either naturally accompany, or which might be ſuppoſed to accompany, the particular objects repreſented. The ſymphony in the French opera of Alcyone, which imitated the violence of the winds and the daſhing of the waves, in the tempeſt which was to drown

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Coix, is much commended by cotemporary writers. That in the opera of Iſſe, which imitated that murmuring in the leaves of the oaks of Dodona, which might be ſuppoſed to precede the miraculous pronunciation of the oracle: and that in the opera of Amadis, of which the diſmal accents imitated the ſounds which might be ſuppoſed to accompany the opening of the tomb of Ardan, before the apparition of the ghoſt of that warrior, are ſtill more celebrated. Inſtrumental Muſic, however, without violating too much its own melody and harmony, can imitate but imperfectly the ſounds of natural objects, of which the greater part have neither melody nor harmony. Great reſerve, great diſcretion, and a very nice diſcernment are requiſite, in order to introduce with propriety ſuch imperfect imitations, either into Poetry or Muſic; when repeated too often, when continued too long, they appear to be what they really are, mere tricks, in which a very inferior artiſt, if he will only give himſelf the trouble to attend to them, can eaſily equal the greateſt. I have ſeen a Latin tranſlation of Mr. Pope's Ode on St. Cecilia's Day, which in this reſpect very much excelled the original. Such imitations are *ſtill* eaſier in Muſic. Both in the one art and in the other, the difficulty is not in making them as well as they are capable of being made, but in knowing when and how far to make them at all: but to be able to accommodate the temper and character of the Muſic to every peculiarity of the ſcene and ſituation with ſuch exact preciſion, that the one ſhall produce the very ſame effect upon the mind as the other, is not one of thoſe tricks in which an inferior artiſt can eaſily equal the greateſt; it is an art which requires all the judgment, knowledge, and invention of the moſt conſummate maſter. It is upon this art, and not upon its imperfect imitation, either of real or imaginary ſounds, that the great effects of inſtrumental Muſic depend; ſuch imitations ought perhaps to be admitted only ſo far as they may ſometimes contribute

to aſcertain the meaning, and thereby to enhance the effects of this art.

By endeavouring to extend the effects of ſcenery beyond what the nature of the thing will admit of, it has been much abuſed; and in the common, as well as in the muſical drama, many imitations have been attempted, which, after the firſt and ſecond time we have ſeen them, neceſſarily appear ridiculous: ſuch are, the Thunder rumbling from the Muſtard-bowl, and the Snow of Paper and thick Hail of Peaſe, ſo finely expoſed by Mr. Pope. Such imitations reſemble thoſe of painted Statuary; they may ſurprize at firſt, but they diſguſt ever after, and appear evidently ſuch ſimple and eaſy tricks as are fit only for the amuſement of children and their nurſes at a puppet-ſhow. The thunder of either theatre ought certainly never to be louder than that which the orcheſtre is capable of producing; and their moſt dreadful tempeſts ought never to exceed what the ſcene painter is capable of repreſenting. In ſuch imitations there may be an art which merits ſome degree of eſteem and admiration. In the other there can be none which merits any.

This abuſe of ſcenery has both ſubſiſted much longer, and been carried to a much greater degree of extravagance, in the muſical than in the common drama. In France it has been long baniſhed from the latter; but it ſtill continues, not only to be tolerated, but to be admired and applauded in the former. In the French operas, not only thunder and lightning, ſtorms and tempeſts, are commonly repreſented in the ridiculous manner above mentioned, but all the marvellous, all the ſupernatural of Epic Poetry, all the metamorphoſes of Mythology, all the wonders of Witchcraft and Magic, every thing that is moſt unfit to be repreſented upon the ſtage, are every day exhibited with the moſt complete approbation and applauſe of that ingenious nation. The Muſic of the orcheſtre producing

ducing upon the audience nearly the ſame effect which a better and more artful imitation would produce, hinders them from feeling, at leaſt in its full force, the ridicule of thoſe childiſh and aukward imitations which neceſſarily abound in that extravagant ſcenery. And in reality ſuch imitations, though no doubt ridiculous every where, yet certainly appear ſomewhat leſs ſo in the muſical than they would in the common drama. The Italian opera, before it was reformed by Apoſtolo, Zeno, and Metaſtaſio, was in this reſpect equally extravagant, and was upon that account the ſubject of the agreeable raillery of Mr. Addiſon in ſeveral different papers of the Spectator. Even ſince that reformation it ſtill continues to be a rule, that the ſcene ſhould change at leaſt with every act; and the unity of place never was a more ſacred law in the common drama, than the violation of it has become in the muſical: the latter ſeems in reality to require both a more pictureſque and a more varied ſcenery, than is at all neceſſary for the former. In an opera, as the Muſic ſupports the effect of the ſcenery, ſo the ſcenery often ſerves to determine the character, and to explain the meaning of the Muſic; it ought to vary therefore as that character varies. The pleaſure of an opera, beſides, is in its nature more a ſenſual pleaſure, than that of a common comedy or tragedy; the latter produce their effect principally by means of the imagination: in the cloſet, accordingly, their effect is not much inferior to what it is upon the ſtage. But the effect of an opera is ſeldom very great in the cloſet; it addreſſes itſelf more to the external ſenſes, and as it ſoothes the ear by its melody and harmony, ſo we feel that it ought to dazzle the eye with the ſplendour and variety of its ſcenery.

In an opera the inſtrumental Muſic of the orcheſtre ſupports the imitation both of the poet and of the actor, as well as of the ſcene-painter. The overture diſpoſes the mind to that mood which fits it for the opening of the piece. The Muſic between the acts keeps

up the impreſſion which the foregoing had made, and prepares us for that which the following is to make. When the orcheſtre interrupts, as it frequently does, either the recitative or the air, it is in order either to enforce the effect of what had gone before, or to put the mind in the mood which fits it for hearing what is to come after. Both in the recitatives and in the airs it accompanies and directs the voice, and often brings it back to the proper tone and modulation, when it is upon the point of wandering away from them; and the correctneſs of the beſt vocal Muſic is owing in a great meaſure to the guidance of inſtrumental; though in all theſe caſes it ſupports the imitation of another art, yet in all of them it may be ſaid rather to diminiſh than to increaſe the reſemblance between the imitating and the imitated object. Nothing can be more unlike to what really paſſes in the world, than that perſons engaged in the moſt intereſting ſituations, both of public and private life, in ſorrow, in diſappointment, in diſtreſs, in deſpair, ſhould, in all that they ſay and do, be conſtantly accompanied with a fine concert of inſtrumental Muſic. Were we to reflect upon it, ſuch accompaniment muſt in all caſes diminiſh the probability of the action, and render the repreſentation ſtill leſs like nature than it otherwiſe would be. It is not by imitation, therefore, that inſtrumental Muſic ſupports and enforces the imitations of the other arts; but it is by producing upon the mind, in conſequence of other powers, the ſame ſort of effect which the moſt exact imitation of nature, which the moſt perfect obſervation of probability, could produce. To produce this effect is, in ſuch entertainments, the ſole end and purpoſe of that imitation and obſervation. If it can be equally well produced by other means, this end and purpoſe may be equally well anſwered.

But if inſtrumental Muſic can ſeldom be ſaid to be properly imitative, even when it is employed to ſupport the imitation of ſome other art, it is commonly ſtill leſs ſo when it is employed alone. Why

Why ſhould it embarraſs its melody and harmony, or conſtrain its time and meaſure, by attempting an imitation which, without the accompaniment of ſome other art to explain and interpret its meaning, nobody is likely to underſtand? In the moſt approved inſtrumental Muſic, accordingly, in the overtures of Handel and the concertos of Correlli, there is little or no imitation, and where there is any, it is the ſource of but a very ſmall part of the merit of thoſe compoſitions. Without any imitation, inſtrumental Muſic can produce very conſiderable effects; though its powers over the heart and affections are, no doubt, *much inferior* to thoſe of vocal Muſic, it has, however, *conſiderable* powers: by the ſweetneſs of its ſounds it awakens agreeably, and calls upon the attention; by their connection and affinity it naturally detains that attention, which follows eaſily a ſeries of agreeable ſounds, which have all a certain relation both to a common, fundamental, or leading note, called the key note; and to a certain ſucceſſion or combination of notes, called the ſong or compoſition. By means of this relation each foregoing ſound ſeems to introduce, and as it were prepare the mind for the following: by its rythmus, by its time and meaſure, it diſpoſes that ſucceſſion of ſounds into a certain arrangement, which renders the whole more eaſy to be comprehended and remembered. Time and meaſure are to inſtrumental Muſic what order and method are to diſcourſe; they break it into proper parts and diviſions, by which we are enabled both to remember better what is gone before, and frequently to foreſee ſomewhat of what is to come after: we frequently foreſee the return of a period which we know muſt correſpond to another which we remember to have gone before; and, according to the ſaying of an ancient philoſopher and muſician, the enjoyment of Muſic ariſes partly from memory and partly from foreſight. When the meaſure, after having been continued ſo long as to ſatisfy us, changes to another, that variety, which thus diſappoints, becomes more agreeable to us than the uniformity which would have gratified

tified our expectation: but without this order and method we could remember very little of what had gone before, and we could foreſee ſtill leſs of what was to come after; and the whole enjoyment of Muſic would be equal to little more than the effect of the particular ſounds which rung in our ears at every particular inſtant. By means of this order and method it is, during the progreſs of the entertainment, equal to the effect of all that we remember, and of all that we foreſee; and at the concluſion, to the combined and accumulated effect of all the different parts of which the whole was compoſed.

A well-compoſed concerto of inſtrumental Muſic, by the number and variety of the inſtruments, by the variety of the parts which are performed by them, and the perfect concord or correſpondence of all theſe different parts; by the exact harmony or coincidence of all the different ſounds which are heard at the ſame time, and by that happy variety of meaſure which regulates the ſucceſſion of thoſe which are heard at different times, preſents an object ſo agreeable, ſo great, ſo various, and ſo intereſting, that alone, and without ſuggeſting any other object, either by imitation or otherwiſe, it can occupy, and as it were fill up, completely the whole capacity of the mind, ſo as to leave no part of its attention vacant for thinking of any thing elſe. In the contemplation of that immenſe variety of agreeable and melodious ſounds, arranged and digeſted, both in their coincidence and in their ſucceſſion, into ſo complete and regular a ſyſtem, the mind in reality enjoys not only a very great ſenſual, but a very high intellectual, pleaſure, not unlike that which it derives from the contemplation of a great ſyſtem in any other ſcience. A full concerto of ſuch inſtrumental Muſic, not only does not require, but it does not admit of any accompaniment. A ſong or a dance, by demanding an attention which we have not to ſpare, would diſturb, inſtead of heightening, the effect of the Muſic; they may

may often very properly ſucceed, but they cannot accompany it. That muſic ſeldom means to tell any particular ſtory, or to imitate any particular event, or in general to ſuggeſt any particular object, diſtinct from that combination of ſounds of which itſelf is compoſed. Its meaning, therefore, may be ſaid to be complete in itſelf, and to require no interpreters to explain it. What is called the ſubject of ſuch Muſic is merely, as has already been ſaid, a certain leading combination of notes, to which it frequently returns, and to which all its digreſſions and variations bear a certain affinity. It is altogether different from what is called the ſubject of a poem or a picture, which is always ſomething which is not either in the poem or in the picture, or ſomething quite diſtinct from that combination, either of words on the one hand, or of colours on the other, of which they are reſpectively compoſed. The ſubject of a compoſition of inſtrumental Muſic is a part of that compoſition: the ſubject of a poem or picture is no part of either.

The effect of inſtrumental Muſic upon the mind has been called its expreſſion. In the feeling it is frequently not unlike the effect of what is called the expreſſion of Painting, and is ſometimes equally intereſting. But the effect of the expreſſion of Painting ariſes always from the thought of ſomething which, though diſtinctly and clearly ſuggeſted by the drawing and colouring of the picture, is altogether different from that drawing and colouring. It ariſes ſometimes from ſympathy with, ſometimes from antipathy and averſion to, the ſentiments, emotions, and paſſions which the countenance, the action, the air and attitude of the perſons repreſented ſuggeſt. The melody and harmony of inſtrumental Muſic, on the contrary, do not diſtinctly and clearly ſuggeſt any thing that is different from that melody and harmony. Whatever effect it produces is the immediate effect of that melody and harmony, and not of ſomething elſe which is ſignified and ſuggeſted by them: they in fact ſignify

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and ſuggeſt nothing. It may be proper to ſay that the complete art of painting, the complete merit of a picture, is compoſed of three diſtinct arts or merits; that of drawing, that of colouring, and that of expreſſion. But to ſay, as Mr. Aviſon does, that the complete art of a muſician, the complete merit of a piece of Muſic, is compoſed or made up of three diſtinct arts or merits, that of melody, that of harmony, and that of expreſſion, is to ſay, that it is made up of melody and harmony, and of the immediate and neceſſary effect of melody and harmony; the diviſion is by no means logical; expreſſion in painting is not the neceſſary effect either of good drawing or of good colouring, or of both together; a picture may be both finely drawn and finely coloured, and yet have very little expreſſion: but that effect upon the mind which is called expreſſion in Muſic, is the immediate and neceſſary effect of good melody. In the power of producing this effect conſiſts the eſſential characteriſtic which diſtinguiſhes ſuch melody from what is bad or indifferent. Harmony may enforce the effect of good melody, but without good melody the moſt ſkilful harmony can produce no effect which deſerves the name of expreſſion; it can do little more than fatigue and confound the ear. A painter may poſſeſs, in a very eminent degree, the talents of drawing and colouring, and yet poſſeſs that of expreſſion in a very inferior degree. Such a painter, too, may have great merit. In the judgment of Du Piles, even the celebrated Titian was a painter of this kind. But to ſay that a muſician poſſeſſed the talents of melody and harmony in a very eminent degree, and that of expreſſion in a very inferior one, would be to ſay, that in his works the cauſe was not followed by its neceſſary and proportionable effect. A muſician may be a very ſkilful harmoniſt, and yet be defective in the talents of melody, air, and expreſſion; his ſongs may be dull and without effect. Such a muſician too may have a certain degree of merit, not unlike that of a man of great learning, who wants fancy, taſte, and invention.

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Inſtrumental Muſic, therefore, though it may, no doubt, be conſidered in ſome reſpects as an imitative art, is certainly leſs ſo than any other which merits that appellation; it can imitate but a few objects, and even theſe ſo imperfectly, that without the accompaniment of ſome other art, its imitation is ſcarce ever intelligible: imitation is by no means eſſential to it, and the principal effects which it is capable of producing ariſes from powers altogether different from thoſe of imitation.

PART III.

THE imitative powers of Dancing are much ſuperior to thoſe of inſtrumental Muſic, and are at leaſt equal, perhaps ſuperior, to thoſe of any other art. Like inſtrumental Muſic, however, it is not neceſſarily or eſſentially imitative, and it can produce very agreeable effects, without imitating any thing. In the greater part of our common dances there is little or no imitation, and they conſiſt almoſt entirely of a ſucceſſion of ſuch ſteps, geſtures, and motions, regulated by the time and meaſure of Muſic, as either diſplay extraordinary grace or require extraordinary agility. Even ſome of our dances, which are ſaid to have been originally imitative, have in the way in which we practiſe them, almoſt ceaſed to be ſo. The minuet, in which the woman, after paſſing and repaſſing the man ſeveral times, firſt gives him up one hand, then the other, and then both hands, is ſaid to have been originally a Mooriſh dance, which emblematically repreſented the paſſion of love. Many of my readers may have frequently danced this dance, and, in the opinion

of all who ſaw them, with great grace and propriety, though neither they nor their ſpectators once thought of the allegorical meaning which it originally intended to expreſs.

A certain meaſured, cadenced ſtep, commonly called a dancing ſtep, which keeps time with, and as it were beats the meaſure of, the Muſic which accompanies and directs it, is the eſſential characteriſtic which diſtinguiſhes a dance from every other ſort of motion. When the dancer, moving with a ſtep of this kind, and obſerving this time and meaſure, imitates either the ordinary or the more important actions of human life, he ſhapes and faſhions, as it were, a thing of one kind, into the reſemblance of another thing of a very different kind: his art conquers the diſparity which Nature has placed between the imitating and the imitated object, and has upon that account ſome degree of that ſort of merit which belongs to all the imitative arts. This diſparity, indeed, is not ſo great as in ſome other of thoſe arts, nor conſequently the merit of the imitation which conquers it. Nobody would compare the merit of a good imitative dancer to that of a good painter or ſtatuary. The dancer, however, may have a very conſiderable degree of merit, and his imitation perhaps may ſometimes be capable of giving us as much pleaſure as that of either of the other two artiſts. *All* the ſubjects, either of Statuary or of Hiſtory Painting, are within the compaſs of his imitative powers; and in repreſenting them, his art has even ſome advantage over both the other two. Statuary and Hiſtory Painting can repreſent but a ſingle inſtant of the action which they mean to imitate: the cauſes which prepared, the conſequences which followed, the ſituation of that ſingle inſtant are altogether beyond the compaſs of their imitation. A pantomime dance can repreſent diſtinctly thoſe cauſes and conſequences; it is not confined to the ſituation of a ſingle inſtant; but, like Epic Poetry, it can repreſent all the events of a long ſtory, and exhibit a long train

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and ſucceſſion of connected and intereſting ſituations. It is capable therefore of affecting us much more than either Statuary or Painting. The ancient Romans uſed to ſhed tears at the repreſentations of their pantomimes, as we do at that of the moſt intereſting tragedies; an effect which is altogether beyond the powers of Statuary or Painting.

The ancient Greeks appear to have been a nation of dancers, and both their common and their ſtage dances ſeem to have been all imitative. The ſtage dances of the ancient Romans appear to have been equally ſo. Among that grave people it was reckoned indecent to dance in private ſocieties; and they could therefore have no common dances. Among both nations imitation ſeems to have been conſidered as eſſential to dancing.

It is quite otherwiſe in modern times: though we have pantomime dances upon the ſtage, yet the greater part even of our ſtage dances are not pantomime, and cannot well be ſaid to imitate any thing. The greater part of our common dances either never were pantomime, or, with a very few exceptions, have almoſt all ceaſed to be ſo.

This remarkable difference of character between the ancient and the modern dances ſeems to be the natural effect of a correſpondent difference in that of the Muſic, which has accompanied and directed both the one and the other.

In modern times we almoſt always dance to inſtrumental Muſic, which being itſelf not imitative, the greater part of the dances which it directs, and as it were inſpires, have ceaſed to be ſo. In ancient times, on the contrary, they ſeem to have danced almoſt always to vocal Muſic: which being neceſſary and eſſentially imitative, their

dances became to too. The ancients ſeem to have had little or nothing of what is properly called inſtrumental Muſic, or of Muſic compoſed not to be ſung by the voice, but to be played upon inſtruments, and both their wind and their ſtringed inſtruments ſeem to have ſerved only as an accompaniment and direction to the voice.

In the country it frequently happens that a company of young people take a fancy to dance, though they have neither fiddler nor piper to dance to. A lady undertakes to ſing while the reſt of the company dance: in moſt caſes ſhe ſings the notes only, without the words, and then the voice being little more than a muſical inſtrument, the dance is performed in the uſual way, without any imitation. But if ſhe ſings the words, and if in thoſe words there happens to be ſomewhat more than ordinary ſpirit and humour, immediately all the company, eſpecially all the beſt dancers, and all thoſe who dance moſt at their eaſe, become more or leſs pantomimes, and by their geſtures and motions expreſs, as well as they can, the meaning and ſtory of the ſong. This would be ſtill more the caſe, if the ſame perſon both danced and ſung; a practice very common among the ancients: it requires good lungs and a vigorous conſtitution; but with theſe advantages and long practice, the very higheſt dances may be performed in this manner. I have ſeen a Negro dance to his own ſong, the war-dance of his own country, with ſuch vehemence of action and expreſſion, that the whole company, gentlemen as well as ladies, got up upon chairs and tables, to be as much as poſſible out of the way of his fury. In the Greek language there are two verbs which both ſignify to dance; each of which has its proper derivatives, ſignifying a dance and a dancer. In the greater part of Greek authors, theſe two ſets of words, like all others which are nearly ſynonimous, are frequently confounded, and uſed promiſcuouſly. According to the beſt critics, however, in ſtrict

ſtrict propriety, one of theſe verbs ſignifies to dance and ſing at the ſame time, or to dance to one's own muſic. The other to dance without ſinging, or to dance to the muſic of other people. There is ſaid too to be a correſpondent difference in the ſignification of their reſpective derivatives. In the choruſes of the ancient Greek tragedies, conſiſting ſometimes of more than fifty perſons, ſome piped and ſome ſung, but all danced, and danced to their own muſic.

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☞ [*The following Obſervations were found among Mr.* SMITH's *Manuſcripts, without any intimation whether they were intended as part of this, or of a different Eſſay. As they appeared too valuable to be ſuppreſſed, the Editors have availed themſelves of their connection with the paſſage referred to in* p. 149. *and have annexed them to this Eſſay.*]

Of the Affinity between Muſic, Dancing, and Poetry.

IN the ſecond part of this Eſſay I have mentioned the connection between the two arts of *Muſic* and *Dancing* formed by the *Rythmus*, as the ancients termed it, or, as we call it, the tune or meaſure that equally regulates both.

It is not, however, every ſort of ſtep, geſture, or motion, of which the correſpondence with the tune or meaſure of Muſic will conſtitute a Dance. It muſt be a ſtep, geſture, or motion of a particular ſort. In a good opera-actor, not only the modulations and

pauſes of his voice, but every motion and geſture, every variation, either in the air of his head or in the attitude of his body, correſpond to the time and meaſure of Muſic. The beſt opera-actor, however, is not, according to the language of any country in Europe, underſtood to dance, yet in the performance of his part he generally makes uſe of what is called the ſtage ſtep; but even this ſtep is not underſtood to be a dancing ſtep.

Though the eye of the moſt ordinary ſpectator readily diſtinguiſhes between what is called a dancing ſtep and any other ſtep, geſture, or motion, yet it may not perhaps be very eaſy to expreſs what it is which conſtitutes this diſtinction. To aſcertain exactly the preciſe limits at which the one ſpecies begins, and the other ends, or to give an accurate definition of this very frivolous matter, might perhaps require more thought and attention, than the very ſmall importance of the ſubject may ſeem to deſerve. Were I, however, to attempt to do this, I ſhould obſerve, that though in performing any ordinary action—in walking, for example—from the one end of the room to the other, a perſon may ſhow both grace and agility, yet if he betrays the leaſt intention of ſhowing either, he is ſure of offending more or leſs, and we never fail to accuſe him of ſome degree of vanity and affectation. In the performance of any ſuch ordinary action, every perſon wiſhes to appear to be ſolely occupied about the proper purpoſe of the action: if he means to ſhow either grace or agility, he is careful to conceal that meaning, and he is very ſeldom ſucceſsful in doing ſo; he offends, however, juſt in proportion as he betrays it, and he almoſt always betrays it. In Dancing, on the contrary, every perſon profeſſes, and avows, as it were, the intention of diſplaying ſome degree either of grace, or of agility, or of both. The diſplay of one, or other, or both of theſe qualities, is in reality the proper purpoſe of the action; and there can never be any diſagreeable vanity or affectation in following out the proper

proper purpoſe of any action. When we ſay of any particular perſon, that he gives himſelf many affected airs and graces in Dancing, we mean either that he gives himſelf airs and graces which are unſuitable to the nature of the Dance, or that he executes aukwardly, perhaps exaggerates too much, (the moſt common fault in Dancing,) the airs and graces which are ſuitable to it. Every Dance is in reality a ſucceſſion of airs and graces of ſome kind or other, and of airs and graces which, if I may ſay ſo, profeſs themſelves to be ſuch. The ſteps, geſtures, and motions which, as it were, avow the intention of exhibiting a ſucceſſion of ſuch airs and graces, are the ſteps, geſtures, and motions which are peculiar to Dancing, and when theſe are performed to the time and meaſure of Muſic, they conſtitute what is properly called a Dance.

But though every ſort of ſtep, geſture, or motion, even though performed to the time and meaſure of Muſic, will not alone make a Dance, yet almoſt any ſort of ſound, provided it is repeated with a diſtinct rythmus, or according to a diſtinct time and meaſure, though without any variation as to gravity or acuteneſs, will make a ſort of Muſic, no doubt indeed, an imperfect one. Drums, cymbals, and, ſo far as I have obſerved, all other inſtruments of percuſſion, have only one note; this note, however, when repeated with a certain rythmus, or according to a certain time and meaſure, and ſometimes, in order to mark more diſtinctly that time and meaſure, with ſome little variation as to loudneſs and lowneſs, though without any as to acuteneſs and gravity, does certainly make a ſort of Muſic, which is frequently far from being diſagreeable, and which even ſometimes produces conſiderable effects. The ſimple note of ſuch inſtruments, it is true, is generally a very clear, or what is called a melodious, ſound. It does not however ſeem indiſpenſably neceſſary that it ſhould be ſo. The ſound of the muffled drum, when it beats the dead march, is far from being either clear

or melodious, and yet it certainly produces a ſpecies of Muſic, which is ſometimes affecting. Even in the performance of the moſt humble of all artiſts, of the man who drums upon the table with his fingers, we may ſometimes diſtinguiſh the meaſure, and perhaps a little of the humour, of ſome favourite ſong; and we muſt allow that even he makes ſome ſort of Muſic. Without a proper ſtep and motion, the obſervation of tune alone will not make a Dance; time alone, without tune, will make ſome ſort of Muſic.

That exact obſervation of tune, or of the proper intervals of gravity and acuteneſs, which conſtitutes the great beauty of all perfect Muſic, conſtitutes likewiſe its great difficulty. The time or meaſure of a ſong are ſimple matters, which even a coarſe and unpractiſed ear is capable of diſtinguiſhing and comprehending: but to diſtinguiſh and comprehend all the variations of the tune, and to conceive with preciſion, the exact proportion of every note, is what the fineſt and moſt cultivated ear is frequently no more than capable of performing. In the ſinging of the common people we may generally remark a diſtinct enough obſervation of time, but a very imperfect one of tune. To diſcover and to diſtinguiſh with preciſion the proper intervals of tune, muſt have been a work of long experience and much obſervation. In the theoretical treatiſes upon Muſic, what the authors have to ſay upon time is commonly diſcuſſed in a ſingle chapter of no great length or difficulty. The theory of tune fills commonly all the reſt of the volume, and has long ago become both an extenſive and an abſtruſe ſcience, which is often but imperfectly comprehended, even by intelligent artiſts. In the firſt rude efforts of uncivilized nations towards ſinging, the niceties of tune could be but little attended to: I have, upon this account, been frequently diſpoſed to doubt of the great antiquity of thoſe national ſongs, which it is pretended have been delivered down from age to age by a ſort of oral tradition, without having been ever noted, or diſtinctly recorded

recorded for many ſucceſſive generations. The meaſure, the humour of the ſong, might perhaps have been delivered down in this manner, but it ſeems ſcarcely poſſible that the preciſe notes of the tune ſhould have been ſo preſerved. The method of ſinging ſome of what we reckon our old Scotch ſongs, has undergone great alterations within the compaſs of my memory, and it may have undergone ſtill greater before.

The diſtinction between the ſounds or tones of ſinging and thoſe of ſpeaking ſeems to be of the ſame kind with that between the ſteps, geſtures, and motions of Dancing, and thoſe of any other ordinary action; though in ſpeaking a perſon may ſhow a very agreeable tone of voice, yet if he ſeems to intend to ſhow it, if he appears to liſten to the ſound of his own voice, and as it were to tune it into a pleaſing modulation, he never fails to offend, as guilty of a moſt diſagreeable affectation. In ſpeaking, as in every other ordinary action, we expect and require that the ſpeaker ſhould attend only to the proper purpoſe of the action, the clear and diſtinct expreſſion of what he has to ſay. In ſinging, on the contrary, every perſon profeſſes the intention to pleaſe by the tone and cadence of his voice; and he not only appears to be guilty of no diſagreeable affectation in doing ſo, but we expect and require that he ſhould do ſo. To pleaſe by the choice and arrangement of agreeable ſounds is the proper purpoſe of all Muſic, vocal as well as inſtrumental; and we always expect and require, that every perſon ſhould attend to the proper purpoſe of whatever action he is performing. A perſon may appear to ſing, as well as to dance, affectedly; he may endeavour to pleaſe by ſounds and tones which are unſuitable to the nature of the ſong, or he may dwell too much on thoſe which are ſuitable to it, or in ſome other way he may ſhow an overweening conceit of his own abilities, beyond what ſeems to be warranted by his performance. The diſagreeable affectation appears to conſiſt always, not in attempting to pleaſe by a proper, but by

by ſome improper modulation of the voice. It was early diſcovered that the vibrations of chords or ſtrings, which either in their lengths, or in their denſities, or in their degrees of tenſion, bear a certain proportion to one another, produce ſounds which correſpond exactly, or, as the muſicians ſay, are the uniſons of thoſe ſounds or tones of the human voice which the ear approves of in ſinging. This diſcovery has enabled muſicians to ſpeak with diſtinctneſs and preciſion concerning the muſical ſounds or tones of the human voice; they can always preciſely aſcertain what are the particular ſounds or tones which they mean, by aſcertaining what are the proportions of the ſtrings of which the vibrations produce the uniſons of thoſe ſounds or tones. What are called the intervals; that is, the differences, in point of gravity and acuteneſs, between the ſounds or tones of a ſinging voice, are much greater and more diſtinct than thoſe of the ſpeaking voice. Though the former, therefore, can be meaſured and appreciated by the proportions of chords or ſtrings, the latter cannot. The niceſt inſtruments cannot expreſs the extreme minuteneſs of theſe intervals. The heptamerede of Mr. *Sauveur* could expreſs an interval ſo ſmall as the ſeventh part of what is called a comma, the ſmalleſt interval that is admitted in modern Muſic. Yet even this inſtrument, we are informed by Mr. *Duclos*, could not expreſs the minuteneſs of the intervals in the pronunciation of the Chineſe language; of all the languages in the world, that of which the pronunciation is ſaid to approach the neareſt to ſinging, or in which the intervals are ſaid to be the greateſt.

As the ſounds or tones of the ſinging voice, therefore, can be aſcertained or appropriated, while thoſe of the ſpeaking voice cannot; the former are capable of being noted or recorded, while the latter are not.

OF

THE AFFINITY

BETWEEN CERTAIN

ENGLISH AND ITALIAN VERSES.

OF CERTAIN

ENGLISH AND ITALIAN VERSES.

THE meaſure of the verſes, of which the octave of the Italians, their terzetti, and the greater part of their ſonnets, are compoſed, ſeems to be as nearly the ſame with that of the Engliſh Heroic Rhyme, as the different genius and pronunciation of the two languages will permit.

The Engliſh Heroic Rhyme is ſuppoſed to conſiſt ſometimes of ten, and ſometimes of eleven ſyllables: of ten, when the verſe ends with a ſingle; and of eleven, when it ends with a double rhyme.

The correſpondent Italian verſe is ſuppoſed to conſiſt ſometimes of ten, ſometimes of eleven, and ſometimes of twelve ſyllables, according as it happens to end with a ſingle, a double, or a triple rhyme.

The rhyme ought naturally to fall upon the laſt ſyllable of the verſe; it is proper likewiſe that it ſhould fall upon an accented ſyllable, in order to render it more ſenſible. When, therefore, the accent happens to fall, not upon the laſt ſyllable, but upon that immediately before it, the rhyme muſt fall both upon the accented ſyllable and upon that which is not accented. It muſt be a double rhyme.

In the Italian language, when the accent falls neither upon the laſt ſyllable, nor upon that immediately before it, but upon the third

ſyllable from the end, the rhyme muſt fall upon all the three. It muſt be a triple rhyme, and the verſe is ſuppoſed to conſiſt of twelve ſyllables:

Forsè era ver, non però credibile, &c.

Triple rhymes are not admitted into Engliſh Heroic Verſe.

In the Italian language the accent falls much more rarely, either upon the third ſyllable from the end of a word, or upon the laſt ſyllable, than it does upon the one immediately before the laſt. In reality, this ſecond ſyllable from the end ſeems, in that language, to be its moſt common and natural place. The Italian Heroic Poetry, therefore, is compoſed principally of double rhymes, or of verſes ſuppoſed to conſiſt of eleven ſyllables. Triple rhymes occur but ſeldom, and ſingle rhymes ſtill more ſeldom.

In the Engliſh language the accent falls frequently upon the laſt ſyllable of the word. Our language, beſides, abounds in words of one ſyllable, the greater part of which do (for there are few which do not) admit of being accented. Words of one ſyllable are moſt frequently the concluding words of Engliſh rhymes. For both theſe reaſons, Engliſh Heroic Rhyme is principally compoſed of ſingle rhymes, or of verſes ſuppoſed to conſiſt of ten ſyllables. Double Rhymes occur almoſt as rarely in it, as either ſingle or triple do in the Italian.

The rarity of double rhymes in Engliſh Heroic Verſe makes them appear odd, and aukward, and even ludicrous, when they occur. By the beſt writers, therefore, they are reſerved for light and ludicrous occaſions; when, in order to humour their ſubject, they ſtoop to a more familiar ſtyle than uſual. When Mr. Pope ſays;

Worth makes the man, and want of it the fellow;
The reſt is all but leather or prunello;

he

he means, in compliance with his ſubject, to condeſcend a good deal below the ſtatelineſs of his diction in the Eſſay on Man. Double rhymes abound more in Dryden than in Pope, and in Hudibras more than in Dryden.

The rarity both of ſingle and of triple rhyme in Italian Heroic Verſe, gives them the ſame odd and ludicrous air which double rhymes have in Engliſh Verſe. In Italian, triple rhymes occur more frequently than ſingle rhymes. The ſlippery, or if I may be allowed to uſe a very low, but a very expreſſive word, the glib pronunciation of the triple rhyme *(verſo ſotrucciolo)* ſeems to depart leſs from the ordinary movement of the double rhyme, than the abrupt ending of the ſingle rhyme *(verſo tronco e cadente)* of the verſe that appears to be cut off, and to fall ſhort of the uſual meaſure. Single rhymes accordingly appear in Italian verſe much more burleſque than triple rhymes. Single rhymes occur very rarely in Arioſto; but frequently in the more burleſque poem of Ricciardetto. Triple rhymes occur much oftener in all the beſt writers. It is thus, that what in Engliſh appears to be the verſe of the greateſt gravity and dignity, appears in Italian to be the moſt burleſque and ludicrous; for no other reaſon, I apprehend, but becauſe in the one language it is the ordinary verſe, whereas in the other it departs the moſt from the movement of the ordinary verſe.

The common Italian Heroic Poetry being compoſed of double rhymes, it can admit both of ſingle and of triple rhymes; which ſeem to recede from the common movement on oppoſite ſides to nearly equal diſtances. The common Engliſh Heroic Poetry, conſiſting of ſingle rhymes, it can admit of double; but it cannot admit of triple rhymes, which would recede ſo far from the common movements as to appear perfectly burleſque and ridiculous. In

English, when a word accented upon the third syllable from the end happens to make the last word of a verse, the rhyme falls upon the last syllable only. It is a single rhyme, and the verse consists of no more than ten syllables: but as the last syllable is not accented, it is an imperfect rhyme, which, however, when confined to the second verse of the couplet, and even there introduced but rarely, may have a very agreeable grace, and the line may even seem to run more easy and natural by means of it:

> Bùt of this frâme, the beàrings, and the tìes,
> The strìct connèctions, nìce depèndencies, &c.

When by a well accented syllable in the end of the first line of a couplet, it has once been clearly ascertained what the rhyme is to be, a very slight allusion to it, such as can be made by a syllable of the same termination that is not accented, may often be sufficient to mark the coincidence in the second line; a word of this kind in the end of the first line seldom succeeds so well:

> Th' inhabitants of old Jerusalem
> Were Jebusites; the town so called from them.

A couplet in which both verses were terminated in this manner, would be extremely disagreeable and offensive.

In counting the syllables, even of verses which to the ear appear sufficiently correct, a considerable indulgence must frequently be given, before they can, in either language, be reduced to the precise number of ten, eleven, or twelve, according to the nature of the rhyme. In the following couplet, for example, there are, strictly speaking, fourteen syllables in the first line, and twelve in the second.

> And many a hŭmoŭrous, many an amorous lay
> Was sung by many a bard, on many a day.

By

By the rapidity, however, or, if I may uſe a very low word a ſecond time, by the glibneſs of the pronunciation, thoſe fourteen ſyllables in the firſt line, and thoſe twelve in the ſecond, appear to take up the time but of ten ordinary ſyllables. The words *many a*, though they plainly conſiſt of three diſtinct ſyllables, or ſounds, which are all pronounced ſucceſſively, or the one after the other, yet paſs as but two ſyllables; as do likewiſe theſe words *hŭmoŭroŭs* and *amorous*. The words *heaven* and *given*, in the ſame manner, conſiſt each of them of two ſyllables, which, how rapidly ſoever they may be pronounced, cannot be pronounced but ſucceſſively, or the one after the other. In verſe, however, they are conſidered as conſiſting but of one ſyllable each.

In counting the ſyllables of the Italian Heroic Verſe, ſtill greater indulgences muſt be allowed: three vowels muſt there frequently be counted as making but one ſyllable, though they are all pronounced, rapidly indeed, but in ſucceſſion, or the one after the other, and though no two of them are ſuppoſed to make a dipththong. In theſe licences too, the Italians ſeem not to be very regular, and the ſame concourſe of vowels which in one place makes but one ſyllable, will in another ſometimes make two. There are even ſome words which in the end of a verſe are conſtantly counted for two ſyllables, but which in any other part of it are never counted for more than one; ſuch as *ſuo*, *tuo*, *ſuoi*, *tuoi*.

Ruſcelli obſerves, that in the Italian Heroic Verſe the accent ought to fall upon the fourth, the ſixth, the eighth, and the tenth ſyllables; and that if it falls upon the third, the fifth, the ſeventh, or the ninth ſyllables, it ſpoils the verſe.

In Engliſh, if the accent falls upon any of the above-mentioned odd ſyllables it, qually ſpoils the verſe.

Bow'd their ſtiff necks, loaden with ſtormy blaſts.

Though

Though a line of Milton has not the ordinary movement of an Engliſh Heroic Verſe, the accent falls upon the third and fifth ſyllables.

In Italian frequently, and in Engliſh ſometimes, an accent is with great grace thrown upon the firſt ſyllable: in which caſe it ſeldom happens that any other ſyllable is accented before the fourth:

Cánto l'armé pietóſe e'l capitáno.
Fírſt in theſe fiélds I trý the ſylvan ſtráins.

Both in Engliſh and in Italian the ſecond ſyllable may be accented with great grace, and it generally is ſo when the firſt ſyllable is not accented:

E in van l'inferno a' lui s' oppoſe; e in vàno
S' armò d' Aſia, e di Libia il popol miſto, &c
Let us, ſince life can little more ſupply
Than juſt to look about us, and to die, &c.

Both in Engliſh and in Italian Verſe, an accent, though it muſt never be miſplaced, may ſometimes be omitted with great grace. In the laſt of the above-quoted Engliſh Verſes there is no accent upon the eighth ſyllable; the conjunction *and* not admitting of any. In the following Italian Verſe there is no accent upon the ſixth ſyllable:

O Muſa, tu, che di caduchi allori, &c.

The propoſition *di* will as little admit of an accent as the conjunction *and*. In this caſe, however, when the even ſyllable is not accented, neither of the odd ſyllables immediately before or behind it muſt be accented.

Neither in Engliſh nor in Italian can two accents running be omitted.

It

It muſt be obſerved, that in Italian there are two accents, the grave and the acute: the grave accent is always marked by a ſlight ſtroke over the ſyllable to which it belongs; the acute accent has no mark.

The Engliſh language knows no diſtinction between the grave and the acute accents.

The ſame author obſerves, that in the Italian Verſe the Pauſe, or what the grammarians call the Ceſura, may with propriety be introduced after either the third, the fourth, the fifth, the ſixth, or the ſeventh ſyllables. The like obſervations have been made by ſeveral different writers upon the Engliſh Heroic Verſe. Dobie admires particularly the verſe in which there are two pauſes; one after the fifth, and another after the ninth ſyllable. The example he gives is from Petrarch:

Nel dolce tempo de la prima etade, &c.

In this verſe, the ſecond pauſe, which he ſays comes after the ninth ſyllable, in reality comes in between the two vowels, which, in the Italian way of counting ſyllables, compoſe the ninth ſyllable. It may be doubtful, therefore, whether this pauſe may not be conſidered as coming after the eighth ſyllable. I do not recollect any good Engliſh Verſe in which the pauſe comes in after the ninth ſyllable. We have many in which it comes in after the eighth:

Yet oft, before his infant eyes, would run, *&c.*

In which verſe there are two pauſes; one after the ſecond, and the other after the eighth ſyllable. I have obſerved many Italian Verſes in which the pauſe comes after the ſecond ſyllable.

Both the Engliſh and the Italian Heroic Verſe, perhaps, are not ſo properly compoſed of a certain number of ſyllables, which vary

according to the nature of the rhyme; as of a certain number of intervals, (of five invariably,) each of which is equal in length, or time, to two ordinary diſtinct ſyllables, though it may ſometimes contain more, of which the extraordinary ſhortneſs compenſates the extraordinary number. The cloſe frequently of each of thoſe intervals, but always of every ſecond interval, is marked by a diſtinct accent. This accent may frequently, with great grace, fall upon the beginning of the firſt interval; after which, it cannot, without ſpoiling the verſe, fall any where but upon the cloſe of an interval. The ſyllable or ſyllables which come after the accent that cloſes the fifth interval are never accented. They make no diſtinct interval, but are conſidered as a ſort of excreſcence of the verſe, and are in a manner counted for nothing.

OF THE

EXTERNAL SENSES.

OF THE

EXTERNAL SENSES.

THE Senſes, by which we perceive external objects, are commonly reckoned Five in Number; Seeing, Hearing, Smelling, Taſting, and Touching.

Of theſe, the four firſt mentioned are each of them confined to particular parts or organs of the body; the Senſe of Seeing is confined to the Eyes; that of Hearing to the Ears; that of Smelling to the Noſtrils; and that of Taſting to the Palate. The Senſe of Touching alone ſeems not to be confined to any particular organ, but to be diffuſed through almoſt every part of the body; if we except the hair and the nails of the fingers and toes, I believe through every part of it. I ſhall ſay a few words concerning each of theſe Senſes; beginning with the laſt, proceeding backwards in the oppoſite order to that in which they are commonly enumerated.

Of the Senſe of TOUCHING.

THE objects of Touch always preſent themſelves as preſſing upon, or as reſiſting the particular part of the body which perceives them, or by which we perceive them. When I lay my hand upon the

table, the table preſſes upon my hand, or reſiſts the further motion of my hand, in the ſame manner as my hand preſſes upon the table. But preſſure or reſiſtance neceſſarily ſuppoſes externality in the thing which preſſes or reſiſts. The table could not preſs upon, or reſiſt the further motion of my hand, if it was not external to my hand. I feel it accordingly, as ſomething which is not merely an affection of my hand, but altogether external to, and independant of my hand. The agreeable, indifferent, or painful ſenſation of preſſure, according as I happen to preſs hardly or ſoftly, I feel, no doubt, as affections of my hand; but the thing which preſſes and reſiſts I feel as ſomething altogether different from thoſe affections, as external to my hand, and as altogether independent of it.

In moving my hand along the table it ſoon comes, in every direction, to a place where this preſſure or reſiſtance ceaſes. This place we call the boundary, or end of the table; of which the extent and figure are determined by the extent and direction of the lines or ſurfaces which conſtitute this boundary or end.

It is in this manner that a man born blind, or who has loſt his ſight ſo early that he has no remembrance of viſible objects, may form the moſt diſtinct idea of the extent and figure of all the different parts of his own body, and of every other tangible object which he has an opportunity of handling and examining. When he lays his hand upon his foot, as his hand feels the preſſure or reſiſtance of his foot, ſo his foot feels that of his hand. They are both external to one another, but they are, neither of them, altogether ſo external to him. He feels in both, and he naturally conſiders them as parts of himſelf, or at leaſt as ſomething which belongs to him, and which, for his own happineſs and comfort, it is neceſſary that he ſhould take ſome care of.

When

When he lays his hand upon the table, though his hand feels the preſſure of the table, the table does not feel, at leaſt he does not know that it feels, the preſſure of his hand. He feels it therefore as ſomething external, not only to his hand, but to himſelf, as ſomething which makes no part of himſelf, and in the ſtate and condition of which he has not neceſſarily any concern.

When he lays his hand upon the body either of another man, or of any other animal, though he knows, or at leaſt may know, that they feel the preſſure of his hand as much as he feels that of their body: Yet as this feeling is altogether external to him, he frequently gives no attention to it, and at no time takes any further concern in it than he is obliged to do by that fellow-feeling which Nature has, for the wiſeſt purpoſes, implanted in man, not only towards all other men, but (though no doubt in a much weaker degree) towards all other animals. Having deſtined him to be the governing animal in this little world, it ſeems to have been her benevolent intention to inſpire him with ſome degree of reſpect, even for the meaneſt and weakeſt of his ſubjects.

This power or quality of reſiſtance we call Solidity; and the thing which poſſeſſes it, the Solid Body or Thing. As we feel it as ſomething altogether external to us, ſo we neceſſarily conceive it as ſomething altogether independent of us. We conſider it, therefore, as what we call a Subſtance, or as a thing that ſubſiſts by itſelf, and independent of any other thing. Solid and ſubſtantial, accordingly, are two words which, in common language, are conſidered either as altogether, or as nearly ſynonimous.

Solidity neceſſarily ſuppoſes ſome degree of extenſion, and that in all the three directions of length, breadth, and thickneſs. All the ſolid bodies, of which we have any experience, have ſome degree of ſuch bulk or magnitude. It ſeems to be eſſential to their

their nature, and without it, we cannot even conceive how they ſhould be capable of preſſure or reſiſtance; the powers by which they are made known to us, and by which alone they are capable of acting upon our own, and upon all other bodies.

Extenſion, at leaſt any ſenſible extenſion, ſuppoſes diviſibility. The body may be ſo hard, that our ſtrength is not ſufficient to break it: we ſtill ſuppoſe, however, that if a ſufficient force were applied, it might be ſo broken; and, at any rate, we can always, in fancy at leaſt, imagine it to be divided into two or more parts.

Every ſolid and extended body, if it be not infinite, (as the univerſe may be conceived to be,) muſt have ſome ſhape or figure, or be bounded by certain lines and ſurfaces.

Every ſuch body muſt likewiſe be conceived as capable both of motion and of reſt; both of altering its ſituation with regard to other ſurrounding bodies, and of remaining in the ſame ſituation. That bodies of ſmall or moderate bulk, are capable of both motion and reſt we have conſtant experience. Great maſſes, perhaps, are, according to the ordinary habits of the imagination, ſuppoſed to be more fitted for reſt than for motion. Provided a ſufficient force could be applied, however, we have no difficulty in conceiving that the greateſt and moſt unwieldy maſſes might be made capable of motion. Philoſophy teaches us, (and by reaſons too to which it is ſcarcely poſſible to refuſe our aſſent,) that the earth itſelf, and bodies much larger than the earth, are not only moveable, but are at all times actually in motion, and continually altering their ſituation, in reſpect to other ſurrounding bodies, with a rapidity that almoſt paſſes all human comprehenſion. In the ſyſtem of the univerſe, at leaſt according to the imperfect notions which we have hitherto been able to attain concerning it, the great difficulty ſeems to be,

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not to find the moſt enormous maſſes in motion, but to find the ſmalleſt particle of matter that is perfectly at reſt, with regard to all other ſurrounding bodies.

Theſe four qualities, or attributes of extenſion, diviſibility, figure, and mobility, or the capacity of motion or reſt, ſeem neceſſarily involved in the idea or conception of a ſolid ſubſtance. They are, in reality, inſeparable from that idea or conception, and the ſolid ſubſtance cannot poſſibly be conceived to exiſt without them. No other qualities or attributes ſeem to be involved, in the ſame manner, in this our idea or conception of ſolidity. It would, however, be raſh from thence to conclude that the ſolid ſubſtance can, as ſuch, poſſeſs no other qualities or attributes. This very raſh concluſion, notwithſtanding, has been not only drawn, but inſiſted upon, as an axiom of the moſt indubitable certainty, by philoſophers of very eminent reputation.

Of theſe external and reſiſting ſubſtances, ſome yield eaſily, and change their figure, at leaſt in ſome degree, in conſequence of the preſſure of our hand: others neither yield nor change their figure, in any reſpect, in conſequence of the utmoſt preſſure which our hand alone is capable of giving them. The former we call ſoft, the latter hard, bodies. In ſome bodies the parts are ſo very eaſily ſeparable, that they not only yield to a very moderate preſſure, but eaſily receive the preſſing body within them, and without much reſiſtance allow it to traverſe their extent in every poſſible direction. Theſe are called Fluid, in contradiſtinction to thoſe of which the parts not being ſo eaſily ſeparable, are upon that account peculiarly called Solid Bodies; as if they poſſeſſed, in a more diſtinct and perceptible manner, the characteriſtical quality of ſolidity or the power of reſiſtance. Water, however, (one of the fluids with which we are moſt familiar,) when confined on all ſides, (as in a hollow globe

of metal, which is firſt filled with it, and then ſealed hermetically,) has been found to reſiſt preſſure as much as the hardeſt, or what we commonly call the moſt ſolid bodies.

Some fluids yield ſo very eaſily to the ſlighteſt preſſure, that upon ordinary occaſions we are ſcarcely ſenſible of their reſiſtance; and are upon that account little diſpoſed to conceive them as bodies, or as things capable of preſſure and reſiſtance. There was a time, as we may learn from Ariſtotle and Lucretius, when it was ſuppoſed to require ſome degree of philoſophy to demonſtrate that air was a real ſolid body, or capable of preſſure and reſiſtance. What, in ancient times, and in vulgar apprehenſions, was ſuppoſed to be doubtful with regard to air, ſtill continues to be ſo with regard to light, of which the rays, however condenſed or concentrated, have never appeared capable of making the ſmalleſt reſiſtance to the motion of other bodies, the characteriſtical power or quality of what are called bodies, or ſolid ſubſtances. Some philoſophers accordingly doubt, and ſome even deny, that light is a material or corporeal ſubſtance.

Though all bodies or ſolid ſubſtances reſiſt, yet all thoſe with which we are acquainted appear to be more or leſs compreſſible, or capable of having, without any diminution in the quantity of their matter, their bulk more or leſs reduced within a ſmaller ſpace than that which they uſually occupy. An experiment of the Florentine academy was ſuppoſed to have demonſtrated that water was abſolutely incompreſſible. The ſame experiment, however, having been repeated with more care and accuracy, it appears, that water, though it ſtrongly reſiſts compreſſion, is, however, when a ſufficient force is applied, like all other bodies, in ſome degree liable to it. Air, on the contrary, by the application of a very moderate force, is eaſily reducible within a much ſmaller portion of ſpace than that which

which it uſually occupies. The condenſing engine, and what is founded upon it, the wind-gun, ſufficiently demonſtrate this: and even without the help of ſuch ingenious and expenſive machines, we may eaſily ſatisfy ourſelves of the truth of it, by ſqueezing a full-blown bladder of which the neck is well tied.

The hardneſs or ſoftneſs of bodies, or the greater or ſmaller force with which they reſiſt any change of ſhape, ſeems to depend altogether upon the ſtronger or weaker degree of coheſion with which their parts are mutually attracted to one another. The greater or ſmaller force with which they reſiſt compreſſion may, upon many occaſions, be owing partly to the ſame cauſe: but it may likewiſe be owing to the greater or ſmaller proportion of empty ſpace comprehended within their dimenſions, or intermixed with the ſolid parts which compoſe them. A body which comprehended no empty ſpace within its dimenſions, which, through all its parts, was completely filled with the reſiſting ſubſtance, we are naturally diſpoſed to conceive as ſomething which would be abſolutely incompreſſible, and which would reſiſt, with unconquerable force, every attempt to reduce it within narrower dimenſions. If the ſolid and reſiſting ſubſtance, without moving out of its place, ſhould admit into the ſame place another ſolid and reſiſting ſubſtance, it would from that moment, in our apprehenſion, ceaſe to be a ſolid and reſiſting ſubſtance, and would no longer appear to poſſeſs that quality, by which alone it is made known to us, and which we therefore conſider as conſtituting its nature and eſſence, and as altogether inſeparable from it. Hence our notion of what has been called impenetrability of matter; or of the abſolute impoſſibility that two ſolid reſiſting ſubſtances ſhould occupy the ſame place at the ſame time.

This doctrine, which is as old as Leucippus, Democritus, and Epicurus, was in the laſt century revived by Gaſſendi, and has ſince

been adopted by Newton and the far greater part of his followers. It may at preſent be conſidered as the eſtabliſhed ſyſtem, or as the ſyſtem that is moſt in faſhion, and moſt approved of by the greater part of the philoſophers of Europe. Though it has been oppoſed by ſeveral puzzling arguments, drawn from that ſpecies of metaphyſics which confounds every thing and explains nothing, it ſeems upon the whole to be the moſt ſimple, the moſt diſtinct, and the moſt comprehenſible account that has yet been given of the phœnomena which are meant to be explained by it. I ſhall only obſerve, that whatever ſyſtem may be adopted concerning the hardneſs or ſoftneſs, the fluidity or ſolidity, the compreſſibility or incompreſſibility, of the reſiſting ſubſtance, the certainty of our diſtinct ſenſe and feeling of its Externality, or of its entire independency upon the organ which perceives it, or by which we perceive it, cannot in the ſmalleſt degree be affected by any ſuch ſyſtem. I ſhall not therefore attempt to give any further account of ſuch ſyſtems.

Heat and cold being felt by almoſt every part of the human body, have commonly been ranked along with ſolidity and reſiſtance, among the qualities which are the objects of Touch. It is not, however, I think, in our language proper to ſay that we touch, but that we feel, the qualities of heat and cold. The word *feeling*, though in many caſes we uſe it as ſynonimous to *touching*, has, however, a much more extenſive ſignification, and is frequently employed to denote our internal, as well as our external, affections. We feel hunger and thirſt, we feel joy and ſorrow, we feel love and hatred.

Heat and cold, in reality, though they may frequently be perceived by the ſame parts of the human body, conſtitute an order of ſenſations altogether different from thoſe which are the proper objects of Touch. They are naturally felt, not as preſſing upon the organ,

organ, but as in the organ. What we feel while we ſtand in the ſunſhine during a hot, or in the ſhade during a froſty, day, is evidently felt, not as preſſing upon the body, but as in the body. It does not neceſſarily ſuggeſt the preſence of any external object, nor could we from thence alone infer the exiſtence of any ſuch object. It is a ſenſation which neither does nor can exiſt any where but either in the organ which feels it, or in the unknown principle of perception, whatever that may be, which feels in that organ, or by means of that organ. When we lay our hand upon a table, which is either heated or cooled a good deal beyond the actual temperature of our hand, we have two diſtinct perceptions: firſt, that of the ſolid or reſiſting table, which is neceſſarily felt as ſomething external to, and independent of, the hand which feels it: and ſecondly, that of the heat or cold, which by the contact of the table is excited in our hand, and which is naturally felt as nowhere but in our hand, or in the principle of perception which feels in our hand.

But though the ſenſations of heat and cold do not neceſſarily ſuggeſt the preſence of any external object, we ſoon learn from experience that they are commonly excited by ſome ſuch object; ſometimes by the temperature of ſome external body immediately in contact with our own body, and ſometimes by ſome body at either a moderate or a great diſtance from us; as by the fire in a chamber, or by the ſun in a Summer's day. By the frequency and uniformity of this experience, by the cuſtom and habit of thought which that frequency and uniformity neceſſarily occaſion, the Internal Senſation, and the External Cauſe of that Senſation, come in our conception to be ſo ſtrictly connected, that in our ordinary and careleſs way of thinking, we are apt to conſider them as almoſt one and the ſame thing, and therefore denote them by one and the ſame word. The confuſion, however, is in this caſe more in the word than in the

the thought; for in reality we ſtill retain ſome notion of the diſtinction, though we do not always evolve it with that accuracy which a very ſlight degree of attention might enable us to do. When we move our hand, for example, along the ſurface of a very hot or of a very cold table, though we ſay that the table is hot or cold in every part of it, we never mean that, in any part of it, it feels the ſenſations either of heat or of cold, but that in every part of it, it poſſeſſes the power of exciting one or other of thoſe ſenſations in our bodies. The philoſophers who have taken ſo much pains to prove that there is no heat in the fire, meaning that the ſenſation or feeling of heat is not in the fire, have laboured to refute an opinion which the moſt ignorant of mankind never entertained. But the ſame word being, in common language, employed to ſignify both the ſenſation and the power of exciting that ſenſation, they, without knowing it perhaps, or intending it, have taken advantage of this ambiguity, and have triumphed in their own ſuperiority, when by irreſiſtible arguments they eſtabliſh an opinion which, in words indeed, is diametrically oppoſite to the moſt obvious judgments of mankind, but which in reality is perfectly agreeable to thoſe judgments.

Of the Senſe of TASTING.

WHEN we taſte any ſolid or liquid ſubſtance, we have always two diſtinct perceptions; firſt, that of the ſolid or liquid body, which is naturally felt as preſſing upon, and therefore as external to, and independent of, the organ which feels it; and ſecondly, that of the particular taſte, reliſh, or ſavour which it excites in the palate or organ of Taſting, and which is naturally felt, not as preſſing upon, as external to, or as independent of, that organ; but as altogether

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in the organ, and nowhere but in the organ, or in the principle of perception which feels in that organ. When we ſay that the food which we eat has an agreeable or diſagreeable taſte in every part of it, we do not thereby mean that it has the feeling or ſenſation of taſte in any part of it, but that in every part of it, it has the power of exciting that feeling or ſenſation in our palates. Though in this caſe we denote by the ſame word (in the ſame manner, and for the ſame reaſon, as in the caſe of heat and cold) both the ſenſation and the power of exciting that ſenſation, this ambiguity of language miſleads the natural judgments of mankind in the one caſe as little as in the other. Nobody ever fancies that our food feels its own agreeable or diſagreeable taſte.

Of the Senſe of SMELLING.

EVERY ſmell or odour is naturally felt as in the noſtrils; not as preſſing upon or reſiſting the organ, not as in any reſpect external to, or independent of, the organ, but as altogether in the organ, and nowhere elſe but in the organ, or in the principle of perception which feels in that organ. We ſoon learn from experience, however, that this ſenſation is commonly excited by ſome external body; by a flower, for example, of which the abſence removes, and the preſence brings back, the ſenſation. This external body we conſider as the cauſe of this ſenſation, and we denominate by the ſame words both the ſenſation and the power by which the external body produces this ſenſation. But when we ſay that the ſmell is in the flower, we do not thereby mean that the flower itſelf has any feeling of the ſenſation which we feel; but that it has the power of exciting this ſenſation in our noſtrils, or in the principle of perception which feels in our noſtrils. Though the ſenſation, and the power by which it is excited,

excited, are thus denoted by the ſame word, this ambiguity of language miſleads, in this caſe, the natural judgments of mankind as little as in the two preceding.

Of the Senſe of HEARING.

EVERY ſound is naturally felt as in the Ear, the organ of Hearing. Sound is not naturally felt as reſiſting or preſſing upon the organ, or as in any reſpect external to, or independent of, the organ. We naturally feel it as an affection of our Ear, as ſomething which is altogether in our Ear, and nowhere but in our Ear, or in the principle of perception which feels in our Ear. We ſoon learn from experience, indeed, that the ſenſation is frequently excited by bodies at a conſiderable diſtance from us; often at a much greater diſtance than thoſe ever are which excite the ſenſation of Smelling. We learn too from experience, that this ſound or ſenſation in our Ears receives different modifications, according to the diſtance and direction of the body which originally cauſes it. The ſenſation is ſtronger, the ſound is louder, when that body is near. The ſenſation is weaker, the ſound is lower, when that body is at a diſtance. The ſound, or ſenſation, too undergoes ſome variation according as the body is placed on the right hand or on the left, before or behind us. In common language we frequently ſay, that the ſound ſeems to come from a great or from a ſmall diſtance, from the right hand or from the left, from before or from behind us. We frequently ſay too that we hear a ſound at a great or a ſmall diſtance, on our right hand or on our left. The real ſound, however, the ſenſation in our ear, can never be heard or felt any where but in our ear, it can never change its place, it is incapable of motion, and can come, therefore, neither from the right nor from the left,

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neither from before nor from behind us. The Ear can feel or hear nowhere but where it is, and cannot ſtretch out its powers of perception, either to a great or to a ſmall diſtance, either to the right or to the left. By all ſuch phraſes we in reality mean nothing but to expreſs our opinion concerning either the diſtance, or the direction of the body, which excites the ſenſation of ſound. When we ſay that the ſound is in the bell, we do not mean that the bell hears its own ſound, or that any thing like our ſenſation is in the bell, but that it poſſeſſes the power of exciting that ſenſation in our organ of Hearing. Though in this, as well as in ſome other caſes, we expreſs by the ſame word, both the Senſation, and the Power of exciting that Senſation; this ambiguity of language occaſions ſcarce any confuſion in the thought, and when the different meanings of the word are properly diſtinguiſhed, the opinions of the vulgar, and thoſe of the philoſopher, though apparently oppoſite, turn out to be exactly the ſame.

Theſe four claſſes of ſecondary qualities, as philoſophers have called them, or to ſpeak more properly, theſe four claſſes of Senſations; Heat and Cold, Taſte, Smell, and Sound; being felt, not as reſiſting or preſſing upon the organ; but as in the organ, are not naturally perceived as external and independant ſubſtances; or even as qualities of ſuch ſubſtances; but as mere affections of the organ, and what can exiſt nowhere but in the organ.

They do not poſſeſs, nor can we even conceive them as capable of poſſeſſing, any one of the qualities, which we conſider as eſſential to, and inſeparable from, the external ſolid and independant ſubſtances.

Firſt, They have no extenſion. They are neither long nor ſhort; they are neither broad nor narrow; they are neither deep nor ſhal-

low. The bodies which excite them, the ſpaces within which they may be perceived, may poſſeſs any of thoſe dimenſions; but the Senſations themſelves can poſſeſs none of them. When we ſay of a Note in Muſic, that it is long or ſhort, we mean that it is ſo in point of duration. In point of extenſion we cannot even conceive, that it ſhould be either the one or the other.

Secondly, Thoſe Senſations have no figure. They are neither round nor ſquare, though the bodies which excite them, though the ſpaces within which they may be perceived, may be either the one or the other.

Thirdly, Thoſe Senſations are incapable of motion. The bodies which excite them may be moved to a greater or to a ſmaller diſtance. The Senſations become fainter in the one caſe, and ſtronger in the other. Thoſe bodies may change their direction with regard to the organ of Senſation. If the change be conſiderable, the Senſations undergo ſome ſenſible variation in conſequence of it. But ſtill we never aſcribe motion to the Senſations. Even when the perſon who feels any of thoſe Senſations, and conſequently the organ by which he feels them, changes his ſituation, we never, even in this caſe, ſay, that the Senſation moves, or is moved. It ſeems to exiſt always, where alone it is capable of exiſting, in the organ which feels it. We never even aſcribe to thoſe Senſations the attribute of reſt; becauſe we never ſay that any thing is at reſt, unleſs we ſuppoſe it capable of motion. We never ſay that any thing does not change its ſituation with regard to other things, unleſs we ſuppoſe it capable of changing that ſituation.

Fourthly, Thoſe Senſations, as they have no extenſion, ſo they can have no diviſibility. We cannot even conceive that a degree of

of Heat or Cold, that a Smell, a Taſte, or a Sound, ſhould be divided (in the ſame manner as the ſolid and extended ſubſtance may be divided) into two halves, or into four quarters, or into any other number of parts.

But though all theſe Senſations are equally incapable of diviſion; there are three of them, Taſte, Smell, and Sound; which ſeem capable of a certain compoſition and decompoſition. A ſkilful cook will, by his taſte, perhaps, ſometimes diſtinguiſh the different ingredients, which enter into the compoſition of a new ſauce, and of which the ſimple taſtes make up the compound one of the ſauce. A ſkilful perfumer may, perhaps, ſometimes be able to do the ſame thing with regard to a new Scent. In a concert of vocal and inſtrumental muſic, an acute and experienced Ear readily diſtinguiſhes all the different ſounds which ſtrike upon it at the ſame time, and which may, therefore, be conſidered as making up one compound ſound.

Is it by nature, or by experience, that we learn to diſtinguiſh between ſimple and compound Senſations of this kind? I am diſpoſed to believe that it is altogether by experience; and that naturally all Taſtes, Smells, and Sounds, which affect the organ of Senſation at the ſame time, are felt as ſimple and uncompounded Senſations. It is altogether by experience, I think, that we learn to obſerve the different affinities and reſemblances which the compound Senſation bears to the different ſimple ones, which compoſe it, and to judge that the different cauſes, which naturally excite thoſe different ſimple Senſations, enter into the compoſition of that cauſe which excites the compounded one.

It is ſufficiently evident that this compoſition and decompoſition is altogether different from that union and ſeparation of parts, which conſtitutes the diviſibility of ſolid extenſion.

The Senſations of Heat and Cold ſeem incapable even of this ſpecies of compoſition and decompoſition. The Senſations of Heat and Cold may be ſtronger at one time and weaker at another. They may differ in degree, but they cannot differ in kind. The Senſations of Taſte, Smell, and Sound, frequently differ, not only in degree, but in kind. They are not only ſtronger and weaker, but ſome Taſtes are ſweet and ſome bitter; ſome Smells are agreeable, and ſome offenſive; ſome Sounds are acute, and ſome grave; and each of theſe different kinds or qualities too is capable of an immenſe variety of different modifications. It is the combination of ſuch ſimple Senſations, as differ not only in degree but in kind, which conſtitutes the compounded Senſation.

Theſe four claſſes of Senſations, therefore, having none of the qualities which are eſſential to, and inſeparable from, the ſolid, external, and independant ſubſtances which excite them, cannot be qualities or modifications of thoſe ſubſtances. In reality we do not naturally conſider them as ſuch; though in the way in which we expreſs ourſelves on the ſubject, there is frequently a good deal of ambiguity and confuſion. When the different meanings of words, however, are fairly diſtinguiſhed, theſe Senſations are, even by the moſt ignorant and illiterate, underſtood to be, not the qualities, but merely the effects of the ſolid, external, and independant ſubſtances upon the ſenſible and living organ, or upon the principle of perception which feels in that organ.

Philoſophers,

Philoſophers, however, have not in general ſuppoſed that thoſe exciting bodies produce thoſe Senſations immediately, but by the intervention of one, two, or more intermediate cauſes.

In the Senſation of Taſte, for example, though the exciting body preſſes upon the organ of Senſation, this preſſure is not ſuppoſed to be the immediate cauſe of the Senſation of Taſte. Certain juices of the exciting body are ſuppoſed to enter the pores of the palate, and to excite, in the irritable and ſenſible fibres of that organ, certain motions or vibrations, which produce there the Senſation of Taſte. But how thoſe juices ſhould excite ſuch motions, or how ſuch motions ſhould produce, either in the organ, or in the principle of perception which feels in the organ, the Senſation of Taſte; or a Senſation, which not only does not bear the ſmalleſt reſemblance to any motion, but which itſelf ſeems incapable of all motion, no philoſopher has yet attempted, nor probably ever will attempt to explain to us.

The Senſations of Heat and Cold, of Smell and Sound, are frequently excited by bodies at a diſtance, ſometimes at a great diſtance, from the organ which feels them. But it is a very antient and well-eſtabliſhed axiom in metaphyſics, that nothing can act where it is not; and this axiom, it muſt, I think, be acknowledged, is at leaſt perfectly agreeable to our natural and uſual habits of thinking.

The Sun, the great ſource of both Heat and Light, is at an immenſe diſtance from us. His rays, however, (traverſing, with inconceivable rapidity, the immenſity of the intervening regions,) as they convey the Senſation of Light to our eyes, ſo they convey that of Heat to all the ſenſible parts of our body. They even convey the power of exciting that Senſation to all the other bodies that

ſurround

ſurround us. They warm the earth, and air, we ſay; that is, they convey to the earth and the air the power of exciting that Senſation in our bodies. A common fire produces, in the ſame manner, all the ſame effects; though the ſphere of its action is confined within much narrower limits.

The odoriferous body, which is generally too at ſome diſtance from us, is ſuppoſed to act upon our organs by means of certain ſmall particles of matter, called Effluvia, which being ſent forth in all poſſible directions, and drawn into our noſtrils by the inſpiration of breathing, produce there the Senſation of Smell. The minuteneſs of thoſe ſmall particles of matter, however, muſt ſurpaſs all human comprehenſion. Incloſe in a gold box, for a few hours, a ſmall quantity of muſk. Take out the muſk, and clean the box with ſoap and water as carefully as it is poſſible. Nothing can be ſuppoſed to remain in the box, but ſuch effluvia as, having penetrated into its interior pores, may have eſcaped the effects of this cleanſing. The box, however, will retain the ſmell of muſk for many, I do not know for how many years; and theſe effluvia, how minute ſoever we may ſuppoſe them, muſt have had the powers of ſubdividing themſelves, and of emitting other effluvia of the ſame kind, continually, and without any interruption, during ſo long a period. The niceſt balance, however, which human art has been able to invent, will not ſhow the ſmalleſt increaſe of weight in the box immediately after it has been thus carefully cleaned.

The Senſation of Sound is frequently felt at a much greater diſtance from the ſounding, than that of Smell ever is from the odoriferous body. The vibrations of the ſounding body, however, are ſuppoſed to produce certain correſpondent vibrations and pulſes in the ſurrounding atmoſphere, which being propagated in all directions,

directions, reach our organ of Hearing, and produce there the Senſation of Sound. There are not many philoſophical doctrines, perhaps, eſtabliſhed upon a more probable foundation, than that of the propagation of Sound by means of the pulſes or vibrations of the air. The experiment of the bell, which, in an exhauſted receiver, produces no ſenſible Sound, would alone render this doctrine ſomewhat more than probable. But this great probability is ſtill further confirmed by the computations of Sir Iſaac Newton, who has ſhown that, what is called the velocity of Sound, or the time which paſſes between the commencement of the action of the ſounding body, and that of the Senſation in our ear, is perfectly ſuitable to the velocity with which the pulſes and vibrations of an elaſtic fluid of the ſame denſity with the air, are naturally propagated. Dr. Franklin has made objections to this doctrine, but, I think, without ſucceſs.

Such are the intermediate cauſes by which philoſophers have endeavoured to connect the Senſations in our organs, with the diſtant bodies which excite them. How thoſe intermediate cauſes, by the different motions and vibrations which they may be ſuppoſed to excite on our organs, produce there thoſe different Senſations, none of which bear the ſmalleſt reſemblance to vibration or motion of any kind, no philoſopher has yet attempted to explain to us.

Of the Senſe of SEEING.

DR. BERKLEY, in his New Theory of Viſion, one of the fineſt examples of philoſophical analyſis that is to be found, either in our own, or in any other language, has explained, ſo very diſtinctly, the nature of the objects of Sight: their diſſimilitude to, as well as their correſpondence and connection with thoſe of Touch, that

that I have ſcarcely any thing to add to what he has already done. It is only in order to render ſome things, which I ſhall have occaſion to ſay hereafter, intelligible to ſuch readers as may not have had an opportunity of ſtudying his book, that I have preſumed to treat of the ſame ſubject, after ſo great a Maſter. Whatever I ſhall ſay upon it, if not directly borrowed from him, has at leaſt been ſuggeſted by what he has already ſaid.

That the objects of Sight are not perceived as reſiſting or preſſing upon the organ which perceives them, is ſufficiently obvious. They cannot therefore ſuggeſt, at leaſt in the ſame manner, as the objects of Touch, the externality and independency of their exiſtence.

We are apt, however, to imagine that we ſee objects at a diſtance from us, and that conſequently the externality of their exiſtence is immediately perceived by our Sight. But if we conſider that the diſtance of any object from the eye, is a line turned endways to it; and that this line muſt conſequently appear to it, but as one point; we ſhall be ſenſible that diſtance from the eye cannot be the immediate object of Sight, but that all viſible objects muſt naturally be perceived as cloſe upon the organ, or more properly, perhaps, like all other Senſations, as in the organ which perceives them. That the objects of Sight are all painted in the bottom of the eye, upon a membrane called the *retina*, pretty much in the ſame manner as the like objects are painted in a Camera Obſcura, is well known to whoever has the ſlighteſt tincture of the ſcience of Optics; and the principle of perception, it is probable, originally perceives them, as exiſting in that part of the organ, and nowhere but in that part of the organ. No Optician, accordingly, no perſon who has ever beſtowed any moderate degree of attention upon the nature of Viſion, has ever pretended that diſtance from the eye was the immediate object of Sight. How it is that, by means of

our Sight, we learn to judge of ſuch diſtances, Opticians have endeavoured to explain in ſeveral different ways. I ſhall not, however, at preſent, ſtop to examine their ſyſtems.

The objects of Touch are ſolidity, and thoſe modifications of ſolidity which we conſider as eſſential to it, and inſeparable from it; ſolid extenſion, figure, diviſibility, and mobility.

The objects of Sight are colour, and thoſe modifications of colour which, in the ſame manner, we conſider as eſſential to it, and inſeparable from it; coloured extenſion, figure, diviſibility, and mobility. When we open our eyes, the ſenſible coloured objects, which preſent themſelves to us, muſt all have a certain extenſion, or muſt occupy a certain portion of the viſible ſurface which appears before us. They muſt too have all a certain figure, or muſt be bounded by certain viſible lines, which mark upon that ſurface the extent of their reſpective dimenſions. Every ſenſible portion of this viſible or coloured extenſion muſt be conceived as diviſible, or as ſeparable into two, three, or more parts. Every portion too of this viſible or coloured ſurface muſt be conceived as moveable, or as capable of changing its ſituation, and of aſſuming a different arrangement with regard to the other portions of the ſame ſurface.

Colour, the viſible, bears no reſemblance to ſolidity, the tangible object. A man born blind, or who has loſt his Sight ſo early as to have no remembrance of viſible objects, can form no idea or conception of colour. Touch alone can never help him to it. I have heard, indeed, of ſome perſons who had loſt their Sight after the age of manhood, and who had learned to diſtinguiſh, by the Touch alone, the different colours of cloths or ſilks, the goods which it happened to be their buſineſs to deal in. The powers by which different bodies

excite in the organs of Sight the Senſations of different colours, probably depend upon ſome difference in the nature, configuration, and arrangement of the parts which compoſe their reſpective ſurfaces. This difference may, to a very nice and delicate touch, make ſome difference in the feeling, ſufficient to enable a perſon, much intereſted in the caſe, to make this diſtinction in ſome degree, though probably in a very imperfect and inaccurate one. A man born blind might poſſibly be taught to make the ſame diſtinctions. But though he might thus be able to name the different colours, which thoſe different ſurfaces reflected, though he might thus have ſome imperfect notion of the remote cauſes of theſe Senſations, he could have no better idea of the Senſations themſelves, than that other blind man, mentioned by Mr. Locke, had, who ſaid that he imagined the Colour of Scarlet reſembled the Sound of a Trumpet. A man born deaf may, in the ſame manner, be taught to ſpeak articulately. He is taught how to ſhape and diſpoſe of his organs, ſo as to pronounce each letter, ſyllable, and word. But ſtill, though he may have ſome imperfect idea of the remote cauſes of the Sounds which he himſelf utters, of the remote cauſes of the Senſations which he himſelf excites in other people; he can have none of thoſe Sounds or Senſations themſelves.

If it were poſſible, in the ſame manner, that a man could be born without the Senſe of Touching, that of Seeing could never alone ſuggeſt to him the idea of Solidity, or enable him to form any notion of the external and reſiſting ſubſtance. It is probable, however, not only that no man, but that no animal was ever born without the Senſe of Touching, which ſeems eſſential to, and inſeparable from, the nature of animal life and exiſtence. It is unneceſſary, therefore, to throw away any reaſoning, or to hazard any conjectures, about what might be the effects of what I look upon

upon as altogether an impoſſible ſuppoſition. The eye when preſſed upon by any external and ſolid ſubſtance, feels, no doubt, that preſſure and reſiſtance, and ſuggeſts to us (in the ſame manner as every other feeling part of the body) the external and independent exiſtence of that ſolid ſubſtance. But in this caſe, the eye acts, not as the organ of Sight, but as an organ of Touch; for the eye poſſeſſes the Senſe of Touching in common with almoſt all the other parts of the body.

The extenſion, figure, diviſibility, and mobility of Colour, the ſole object of Sight, though, on account of their correſpondence and connection with the extenſion, figure, diviſibility, and mobility of Solidity, they are called by the ſame name, yet ſeem to bear no ſort of reſemblance to their nameſakes. As Colour and Solidity bear no ſort of reſemblance to one another, ſo neither can their reſpective modifications. Dr. Berkley very juſtly obſerves, that though we can conceive either a coloured or a ſolid line to be prolonged indefinitely, yet we cannot conceive the one to be added to the other. We cannot, even in imagination, conceive an object of Touch to be prolonged into an object of Sight, or an object of Sight into an object of Touch. The objects of Sight and thoſe of Touch conſtitute two worlds, which, though they have a moſt important correſpondence and connection with one another, bear no ſort of reſemblance to one another. The tangible world, as well as all the different parts which compoſe it, has three dimenſions, Length, Breadth, and Depth. The viſible world, as well as all the different parts which compoſe it, has only two, Length and Breadth. It preſents to us only a plain or ſurface, which, by certain ſhades and combinations of Colour, ſuggeſts and repreſents to us (in the ſame manner as a picture does) certain tangible objects which have no Colour, and which therefore can bear no reſemblance to thoſe ſhades and combinations of Colour. Thoſe ſhades and combinations ſug-

geſt thoſe different tangible objects as at different diſtances, according to certain rules of Perſpective, which it is, perhaps, not very eaſy to ſay how it is that we learn, whether by ſome particular inſtinct, or by ſome application of either reaſon or experience, which has become ſo perfectly habitual to us. that we are ſcarcely ſenſible when we make uſe of it

The diſtinctneſs of this Perſpective, the preciſion and accuracy with which, by means of it, we are capable of judging concerning the diſtance of different tangible objects, is greater or leſs, exactly in proportion as this diſtinctneſs, as this preciſion and accuracy are of more or leſs importance to us. We can judge of the diſtance of near objects, of the chairs and tables, for example, in the chamber where we are ſitting, with the moſt perfect preciſion and accuracy; and if in broad day-light we ever ſtumble over any of them, it muſt be, not from any error in the Sight, but from ſome defect in the attention. The preciſion and accuracy of our judgment concerning ſuch near objects are of the utmoſt importance to us, and conſtitute the great advantage which a man who ſees has over one who is unfortunately blind. As the diſtance increaſes, the diſtinctneſs of this Perſpective, the preciſion and accuracy of our judgment gradually diminiſh. Of the tangible objects which are even at the moderate diſtance of one, two, or three miles from the eye, we are frequently at a loſs to determine which is neareſt, and which remoteſt. It is ſeldom of much importance to us to judge with preciſion concerning the ſituation of the tangible objects which are even at this moderate diſtance. As the diſtance increaſes, our judgments become more and more uncertain; and at a very great diſtance, ſuch as that of the fixed ſtars, it becomes altogether uncertain. The moſt preciſe knowledge of the relative ſituation of ſuch objects could be of no other uſe to us than to ſatisfy the moſt unneceſſary curioſity.

The

The diſtances at which different men can by Sight diſtinguiſh, with ſome degree of preciſion, the ſituation of the tangible objects which the viſible ones repreſent, is very different; and this difference, though it, no doubt, may ſometimes depend upon ſome difference in the original configuration of their eyes, yet ſeems frequently to ariſe altogether from the different cuſtoms and habits which their reſpective occupations have led them to contract. Men of letters, who live much in their cloſets, and have ſeldom occaſion to look at very diſtant objects, are ſeldom far-ſighted. Mariners, on the contrary, almoſt always are; thoſe eſpecially who have made many diſtant voyages, in which they have been the greater part of their time out of ſight of land, and have in day-light been conſtantly looking out towards the horizon for the appearance of ſome ſhip, or of ſome diſtant ſhore. It often aſtoniſhes a land-man to obſerve with what preciſion a ſailor can diſtinguiſh in the Offing, not only the appearance of a ſhip, which is altogether inviſible to the land-man, but the number of her maſts, the direction of her courſe, and the rate of her ſailing. If ſhe is a ſhip of his acquaintance, he frequently can tell her name, before the land-man has been able to diſcover even the appearance of a ſhip.

Viſible objects, Colour, and all its different modifications, are in themſelves mere ſhadows or pictures, which ſeem to float, as it were, before the organ of Sight. In themſelves, and independent of their connection with the tangible objects which they repreſent, they are of no importance to us, and can eſſentially neither benefit us nor hurt us. Even while we ſee them we are ſeldom thinking of them. Even when we appear to be looking at them with the greateſt earneſtneſs, our whole attention is frequently employed, not upon them, but upon the tangible objects repreſented by them.

It

It is becauſe almoſt our whole attention is employed, not upon the viſible and repreſenting, but upon the tangible and repreſented objects, that in our imaginations we are apt to aſcribe to the former a degree of magnitude which does not belong to them, but which belongs altogether to the latter. If you ſhut one eye, and hold immediately before the other a ſmall circle of plain glaſs, of not more than half an inch in diameter, you may ſee through that circle the moſt extenſive proſpects; lawns and woods, and arms of the ſea, and diſtant mountains. You are apt to imagine that the Landſcape which is thus preſented to you, that the viſible Picture which you thus ſee, is immenſely great and extenſive. The tangible objects which this viſible Picture repreſents, undoubtedly are ſo. But the viſible Picture which repreſents them can be no greater than the little viſible circle through which you ſee it. If while you are looking through this circle, you could conceive a fairy hand and a fairy pencil to come between your eye and the glaſs, that pencil could delineate upon that little glaſs the outline of all thoſe extenſive lawns and woods, and arms of the ſea, and diſtant mountains, in the full and exact dimenſions with which they are really ſeen by the eye.

Every viſible object which covers from the eye any other viſible object, muſt appear at leaſt as large as that other viſible object. It muſt occupy at leaſt an equal portion of that viſible plain or ſurface which is at that time preſented to the eye. Opticians accordingly tell us, that all the viſible objects which are ſeen under equal angles muſt to the eye appear equally large. But the viſible object, which covers from the eye any other viſible object, muſt neceſſarily be ſeen under angles at leaſt equally large as thoſe under which that other object is ſeen. When I hold up my finger, however, before my eye, it appears to cover the greater part of the viſible chamber in which I am ſitting. It ſhould therefore appear as large as the greater

greater part of that viſible chamber. But becauſe I know that the tangible finger bears but a very ſmall proportion to the greater part of the tangible chamber, I am apt to fancy that the viſible finger bears but a like proportion to the greater part of the viſible chamber. My judgment corrects my eye-ſight, and, in my fancy, reduces the viſible object, which repreſents the little tangible one, below its real viſible dimenſions; and, on the contrary, it augments the viſible object which repreſents the great tangible one a good deal beyond thoſe dimenſions. My attention being generally altogether occupied about the tangible and repreſented, and not at all about the viſible and repreſenting objects, my careleſs fancy beſtows upon the latter a proportion which does not in the leaſt belong to them, but which belongs altogether to the former.

It is becauſe the viſible object which covers any other viſible object muſt always appear at leaſt as large as that other object, that Opticians tell us that the ſphere of our viſion appears to the eye always equally large; and that when we hold our hand before our eye in ſuch a manner that we ſee nothing but the inſide of the hand, we ſtill ſee preciſely the ſame number of viſible points, the ſphere of our viſion is ſtill as completely filled, the retina is as entirely covered with the object which is thus preſented to it, as when we ſurvey the moſt extenſive horizon.

A young gentleman who was born with a cataract upon each of his eyes was, in one thouſand ſeven hundred and twenty-eight, couched by Mr. Cheſelden, and by that means for the firſt time made to ſee diſtinctly. "At firſt, ſays the operator, he could bear but very "little Sight, and the things he ſaw he thought extremely large; "but upon ſeeing things larger, thoſe firſt ſeen he conceived leſs, "never being able to imagine any lines beyond the bounds he ſaw; "the room he was in, he ſaid, he knew to be but part of the houſe,

yet

" yet he could not conceive that the whole houſe would look " bigger." It was unavoidable that he ſhould at firſt conceive, that no viſible object could be greater, could preſent to his eye a greater number of viſible points, or could more completely fill the comprehenſion of that organ, than the narroweſt ſphere of his viſion. And when that ſphere came to be enlarged, he ſtill could not conceive that the viſible objects which it preſented could be larger than thoſe which he had firſt ſeen. He muſt probably by this time have been in ſome degree habituated to the connection between viſible and tangible objects, and enabled to conceive that viſible object to be ſmall which repreſented a ſmall tangible object; and that to be great, which repreſented a great one. The great objects did not appear to his Sight greater than the ſmall ones had done before; but the ſmall ones, which, having filled the whole ſphere of his viſion, had before appeared as large as poſſible, being now known to repreſent much ſmaller tangible objects, ſeemed in his conception to grow ſmaller. He had begun now to employ his attention more about the tangible and repreſented, than about the viſible and repreſenting objects; and he was beginning to aſcribe to the latter, the proportions and dimenſions which properly belonged altogether to the former.

As we frequently aſcribe to the objects of Sight a magnitude and proportion which does not really belong to them, but to the objects of Touch which they repreſent, ſo we likewiſe aſcribe to them a ſteadineſs of appearance, which as little belongs to them, but which they derive altogether from their connection with the ſame objects of Touch. The chair which now ſtands at the farther end of the room, I am apt to imagine, appears to my eye as large as it did when it ſtood cloſe by me, when it was ſeen under angles at leaſt four times larger than thoſe under which it is ſeen at preſent, and when it muſt have occupied, at leaſt, ſixteen times that portion which it occupies at preſent, of the viſible plain or ſurface which is now before my

eyes. But as I know that the magnitude of the tangible and repreſented chair, the principal object of my attention, is the ſame in both ſituations, I aſcribe to the viſible and repreſenting chair (though now reduced to leſs than the ſixteenth part of its former dimenſions) a ſteadineſs of appearance, which certainly belongs not in any reſpect to it, but altogether to the tangible and repreſented one. As we approach to, or retire from, the tangible object which any viſible one repreſents, the viſible object gradually augments in the one caſe, and diminiſhes in the other. To ſpeak accurately, it is not the ſame viſible object which we ſee at different diſtances, but a ſucceſſion of viſible objects, which, though they all reſemble one another, thoſe eſpecially which follow near after one another; yet are all really different and diſtinct. But as we know that the tangible object which they repreſent remains always the ſame, we aſcribe to them too a ſameneſs which belongs altogether to it: and we fancy that we ſee the ſame tree at a mile, at half a mile, and at a few yards diſtance. At thoſe different diſtances, however, the viſible objects are ſo very widely different, that we are ſenſible of a change in their appearance. But ſtill, as the tangible object which they repreſent remains invariably the ſame, we aſcribe a ſort of ſameneſs even to them too.

It has been ſaid, that no man ever ſaw the ſame viſible object twice; and this, though, no doubt, an exaggeration, is, in reality, much leſs ſo than at firſt view it appears to be. Though I am apt to fancy that all the chairs and tables, and other little pieces of furniture in the room where I am ſitting, appear to my eye always the ſame, yet their appearance is in reality continually varying, not only according to every variation in their ſituation and diſtance with regard to where I am ſitting, but according to every, even the moſt inſenſible variation in the altitude of my body, in the movement of my head, or even in that of my eyes. The perſpective

neceſſarily varies according to all, even the ſmalleſt of theſe variations; and conſequently the appearance of the objects which that perſpective preſents to me. Obſerve what difficulty a portrait painter finds, in getting the perſon who ſits for his picture to preſent to him preciſely that view of the countenance from which the firſt outline was drawn. The painter is ſcarce ever completely ſatisfied with the ſituation of the face which is preſented to him, and finds that it is ſcarcely ever preciſely the ſame with that from which he rapidly ſketched the firſt outline. He endeavours, as well as he can, to correct the difference from memory, from fancy, and from a ſort of art of approximation, by which he ſtrives to expreſs as nearly as he can, the ordinary effect of the look, air, and character of the perſon whoſe picture he is drawing. The perſon who draws from a ſtatue, which is altogether immoveable, feels a difficulty, though, no doubt, in a leſs degree, of the ſame kind. It ariſes altogether from the difficulty which he finds in placing his own eye preciſely in the ſame ſituation during the whole time which he employs in completing his drawing. This difficulty is more than doubled upon the painter who draws from a living ſubject. The ſtatue never is the cauſe of any variation or unſteadineſs in its own appearance. The living ſubject frequently is.

The benevolent purpoſe of nature in beſtowing upon us the ſenſe of ſeeing, is evidently to inform us concerning the ſituation and diſtance of the tangible objects which ſurround us. Upon the knowledge of this diſtance and ſituation depends the whole conduct of human life, in the moſt trifling as well as in the moſt important tranſactions. Even animal motion depends upon it; and without it we could neither move, nor even ſit ſtill, with complete ſecurity. The objects of ſight, as Dr. Berkley finely obſerves, conſtitute a ſort of language which the Author of Nature addreſſes to our eyes, and by which he informs us of many things, which it is of the utmoſt

utmoſt importance to us to know. As, in common language, the words or ſounds bear no reſemblance to the things which they denote, ſo, in this other language, the viſible objects bear no ſort of reſemblance to the tangible object which they repreſent, and of whoſe relative ſituation, with regard both to ourſelves and to one another, they inform us.

He acknowledges, however, that though ſcarcely any word be by nature better fitted to expreſs one meaning than any other meaning, yet that certain viſible objects are better fitted than others to repreſent certain tangible objects. A viſible ſquare, for example, is better fitted than a viſible circle to repreſent a tangible ſquare. There is, perhaps, ſtrictly ſpeaking, no ſuch thing as either a viſible cube, or a viſible globe, the objects of ſight being all naturally preſented to the eye as upon one ſurface. But ſtill there are certain combinations of colours which are fitted to repreſent to the eye, both the near and the diſtant, both the advancing and the receding lines, angles, and ſurfaces of the tangible cube; and there are others fitted to repreſent, in the ſame manner, both the near and the receding ſurface of the tangible globe. The combination which repreſents the tangible cube, would not be fit to repreſent the tangible globe; and that which repreſents the tangible globe, would not be fit to repreſent the tangible cube. Though there may, therefore, be no reſemblance between viſible and tangible objects, there ſeems to be ſome affinity or correſpondence between them ſufficient to make each viſible object fitter to repreſent a certain preciſe tangible object than any other tangible object. But the greater part of words ſeem to have no ſort of affinity or correſpondence with the meanings or ideas which they expreſs; and if cuſtom had ſo ordered it, they might with equal propriety have been made uſe of to expreſs any other meanings or ideas.

Dr. Berkley, with that happineſs of illuſtration which ſcarcely ever deſerts him, remarks, that this in reality is no more than what happens in common language; and that though letters bear no ſort of reſemblance to the words which they denote, yet that the ſame combination of letters which repreſents one word, would not always be fit to repreſent another; and that each word is always beſt repreſented by its own proper combination of letters. The compariſon, however, it muſt be obſerved, is here totally changed. The connection between viſible and tangible objects was firſt illuſtrated by comparing it with that between ſpoken language and the meanings or ideas which ſpoken language ſuggeſts to us; and it is now illuſtrated by the connection between written language and ſpoken language, which is altogether different. Even this ſecond illuſtration, beſides, will not apply perfectly to the caſe. When cuſtom, indeed, has perfectly aſcertained the powers of each letter; when it has aſcertained, for example, that the firſt letter of the alphabet ſhall always repreſent ſuch a ſound, and the ſecond letter ſuch another ſound; each word comes then to be more properly repreſented by one certain combination of written letters or characters, than it could be by any other combination. But ſtill the characters themſelves are altogether arbitrary, and have no ſort of affinity or correſpondence with the articulate ſounds which they denote. The character which marks the firſt letter of the alphabet, for example, if cuſtom had ſo ordered it, might, with perfect propriety, have been made uſe of to expreſs the ſound which we now annex to the ſecond, and the character of the ſecond to expreſs that which we now annex to the firſt. But the viſible characters which repreſent to our eyes the tangible globe, could not ſo well repreſent the tangible cube; nor could thoſe which repreſent the tangible cube, ſo properly repreſent the tangible globe. There is evidently, therefore, a certain affinity and correſpondence between each viſible object and

the preciſe tangible object repreſented by it, much ſuperior to what takes place either between written and ſpoken language, or between ſpoken language and the ideas or meanings which it ſuggeſts. The language which nature addreſſes to our eyes, has evidently a fitneſs of repreſentation, an aptitude for ſignifying the preciſe things which it denotes, much ſuperior to that of any of the artificial languages which human art and ingenuity have ever been able to invent.

That this affinity and correſpondence, however, between viſible and tangible objects could not alone, and without the aſſiſtance of obſervation and experience, teach us, by any effort of reaſon, to infer what was the preciſe tangible object which each viſible one repreſented, if it is not ſufficiently evident from what has been already ſaid, it muſt be completely ſo from the remarks of Mr. Cheſelden upon the young gentleman above-mentioned, whom he had couched for a cataract. "Though we ſay of this gentleman, "that he was blind," obſerves Mr. Cheſelden, "as we do of all "people who have ripe cataracts; yet they are never ſo blind from "that cauſe but that they can diſcern day from night; and for the "moſt part, in a ſtrong light, diſtinguiſh black, white, and ſcarlet; "but they cannot perceive the ſhape of any thing; for the light by "which theſe perceptions are made, being let in obliquely through "the aqueous humour, or the anterior ſurface of the cryſtalline, "(by which the rays cannot be brought into a focus upon the "retina,) they can diſcern in no other manner than a ſound eye "can through a glaſs of broken jelly, where a great variety of ſur-"faces ſo differently refract the light, that the ſeveral diſtinct pen-"cils of rays cannot be collected by the eye into their proper foci; "wherefore the ſhape of an object in ſuch a caſe cannot be at all "diſcerned, though the colour may: and thus it was with this "young gentleman, who, though he knew thoſe colours aſunder in "a good light, yet when he ſaw them after he was couched, the "faint

" faint ideas he had of them before were not ſufficient for him to " know them by afterwards; and therefore he did not think them " the ſame which he had before known by thoſe names." This young gentleman, therefore, had ſome advantage over one who from a ſtate of total blindneſs had been made for the firſt time to ſee. He had ſome imperfect notion of the diſtinction of colours; and he muſt have known that thoſe colours had ſome ſort of connection with the tangible objects which he had been accuſtomed to feel. But had he emerged from total blindneſs, he could have learnt this connection only from a very long courſe of obſervation and experience. How little this advantage availed him, however, we may learn partly from the paſſages of Mr. Cheſelden's narrative, already quoted, and ſtill more from the following:

" When he firſt ſaw," ſays that ingenious operator, " he was ſo " far from making any judgment about diſtances, that he thought " all objects whatever touched his eyes (as he expreſſed it) as what " he felt did his ſkin; and thought no objects ſo agreeable as thoſe " which were ſmooth and regular, though he could form no judg- " ment of their ſhape, or gueſs what it was in any object that was " pleaſing to him. He knew not the ſhape of any thing, nor any " one thing from another, however different in ſhape or magni- " tude; but upon being told what things were, whoſe form he be- " fore knew from feeling, he would carefully obſerve, that he might " know them again; but having too many objects to learn at once, " he forgot many of them; and (as he ſaid) at firſt learned to " know, and again forgot a thouſand things in a day. One parti- " cular only (though it may appear trifling) I will relate: Having " often forgot which was the cat, and which the dog, he was " aſhamed to aſk; but catching the cat (which he knew by feeling) " he was obſerved to look at her ſtedfaſtly, and then ſetting her " down, ſaid, So, puſs! I ſhall know you another time."

When

When the young gentleman ſaid, that the objects which he ſaw touched his eyes, he certainly could not mean that they preſſed upon or reſiſted his eyes; for the objects of ſight never act upon the organ in any way that reſembles preſſure or reſiſtance. He could mean no more than that they were cloſe upon his eyes, or, to ſpeak more properly, perhaps, that they were in his eyes. A deaf man, who was made all at once to hear, might in the ſame manner naturally enough ſay, that the ſounds which he heard touched his ears, meaning that he felt them as cloſe upon his ears, or, to ſpeak, perhaps, more properly, as in his ears.

Mr. Cheſelden adds afterwards: "We thought he ſoon knew "what pictures repreſented which were ſhewed to him, but we "found afterwards we were miſtaken; for about two months after "he was couched, he diſcovered at once they repreſented ſolid "bodies, when, to that time, he conſidered them only as party-"coloured planes, or ſurfaces diverſified with variety of paints; "but even then he was no leſs ſurpriſed, expecting the pictures "would feel like the things they repreſented, and was amazed when "he found thoſe parts, which by their light and ſhadow appeared "now round and uneven, felt only flat like the reſt; and aſked "which was the lying ſenſe, feeling or ſeeing?"

Painting, though, by combinations of light and ſhade, ſimilar to thoſe which Nature makes uſe of in the viſible objects which ſhe preſents to our eyes, it endeavours to imitate thoſe objects; yet it never has been able to equal the perſpective of Nature, or to give to its productions that force and diſtinctneſs of relief and projection which Nature beſtows upon hers. When the young gentleman was juſt beginning to underſtand the ſtrong and diſtinct perſpective of Nature, the faint and feeble perſpective of Painting made no impreſſion upon him, and the picture appeared to him what it really

was,

was, a plain ſurface bedaubed with different colours. When he became more familiar with the perſpective of Nature, the inferiority of that of Painting did not hinder him from diſcovering its reſemblance to that of Nature. In the perſpective of Nature, he had always found that the ſituation and diſtance of the tangible and repreſented objects, correſponded exactly to what the viſible and repreſenting ones ſuggeſted to him. He expected to find the ſame thing in the ſimilar, though inferior perſpective of Painting, and was diſappointed when he found that the viſible and tangible objects had not, in this caſe, their uſual correſpondence.

" In a year after ſeeing," adds Mr. Cheſelden, " the young gen-
" tleman being carried upon Epſom-downs, and obſerving a large
" proſpect, he was exceedingly delighted with it, and called it a
" new kind of ſeeing." He had now, it is evident, come to underſtand completely the language of Viſion. The viſible objects which this noble proſpect preſented to him did not now appear as touching, or as cloſe upon his eye. They did not now appear of the ſame magnitude with thoſe ſmall objects to which, for ſome time after the operation, he had been accuſtomed, in the little chamber where he was confined. Thoſe new viſible objects at once, and as it were of their own accord, aſſumed both the diſtance and the magnitude of the great tangible objects which they repreſented. He had now, therefore, it would ſeem, become completely maſter of the language of Viſion, and he had become ſo in the courſe of a year; a much ſhorter period than that in which any perſon, arrived at the age of manhood, could completely acquire any foreign language. It would appear too, that he had made very conſiderable progreſs even in the two firſt months. He began at that early period to underſtand even the feeble perſpective of Painting; and though at firſt he could not diſtinguiſh it from the ſtrong perſpective of Nature, yet he could not have been thus impoſed upon by ſo imperfect an imitation, if the

great

great principles of Viſion had not beforehand been deeply impreſſed upon his mind, and if he had not, either by the aſſociation of ideas, or by ſome other unknown principle, been ſtrongly determined to expect certain tangible objects in conſequence of the viſible ones which had been preſented to him. This rapid progreſs, however, may, perhaps, be accounted for from that fitneſs of repreſentation, which has already been taken notice of, between viſible and tangible objects. In this language of Nature, it may be ſaid, the analogies are more perfect; the etymologies, the declenſions, and conjugations, if one may ſay ſo, are more regular than thoſe of any human language. The rules are fewer, and thoſe rules admit of no exceptions.

But though it may have been altogether by the ſlow paces of obſervation and experience that this young gentleman acquired the knowledge of the connection between viſible and tangible objects; we cannot from thence with certainty infer, that young children have not ſome inſtinctive perception of the ſame kind. In him this inſtinctive power, not having been exerted at the proper ſeaſon, may, from diſuſe, have gone gradually to decay, and at laſt have been completely obliterated. Or, perhaps, (what ſeems likewiſe very poſſible,) ſome feeble and unobſerved remains of it may have ſomewhat facilitated his acquiſition of what he might otherwiſe have found it much more difficult to acquire.

That, antecedent to all experience, the young of at leaſt the greater part of animals poſſeſs ſome inſtinctive perception of this kind, ſeems abundantly evident. The hen never feeds her young by dropping the food into their bills, as the linnet and the thruſh feed theirs. Almoſt as ſoon as her chickens are hatched, ſhe does not feed them, but carries them to the field to feed, where they

walk about at their eaſe, it would ſeem, and appear to have the moſt diſtinct perception of all the tangible objects which ſurround them. We may often ſee them, accordingly, by the ſtraighteſt road, run to and pick up any little grains which ſhe ſhews them, even at the diſtance of ſeveral yards; and they no ſooner come into the light than they ſeem to underſtand this language of Viſion as well as they ever do afterwards. The young of the partridge and of the grouſe ſeem to have, at the ſame early period, the moſt diſtinct perceptions of the ſame kind. The young partridge, almoſt as ſoon it comes from the ſhell, runs about among long graſs and corn; the young grouſe among long heath, and would both moſt eſſentially hurt themſelves if they had not the moſt acute, as well as diſtinct perception of the tangible objects which not only ſurround them but preſs upon them on all ſides. This is the caſe too with the young of the gooſe, of the duck, and, ſo far as I have been able to obſerve, with thoſe of at leaſt the greater part of the birds which make their neſts upon the ground, with the greater part of thoſe which are ranked by Linnæus in the orders of the hen and the gooſe, and of many of thoſe long-ſhanked and wading birds which he places in the order that he diſtinguiſhes by the name of Grallæ.

The young of thoſe birds that build their neſts in buſhes, upon trees, in the holes and crevices of high walls, upon high rocks and precipices, and other places of difficult acceſs; of the greater part of thoſe ranked by Linnæus in the orders of the hawk, the magpie, and the ſparrow, ſeem to come blind from the ſhell, and to continue ſo for at leaſt ſome days thereafter. Till they are able to fly they are fed by the joint labour of both parents. As ſoon as that period arrives, however, and probably for ſome time before, they evidently enjoy all the powers of Viſion in the moſt complete perfection, and can diſtinguiſh with moſt exact preciſion the ſhape and

proportion

proportion of the tangible objects which every viſible one repreſents. In ſo ſhort a period they cannot be ſuppoſed to have acquired thoſe powers from experience, and muſt therefore derive them from ſome inſtinctive ſuggeſtion. The ſight of birds ſeems to be both more prompt and more acute than that of any other animals. Without hurting themſelves they dart into the thickeſt and moſt thorny buſhes, fly with the utmoſt rapidity through the moſt intricate foreſts, and while they are ſoaring aloft in the air, diſcover upon the ground the little inſects and grains upon which they feed.

The young of ſeveral ſorts of quadrupeds ſeem, like thoſe of the greater part of birds which make their neſts upon the ground, to enjoy as ſoon as they come into the world the faculty of ſeeing as completely as they ever do afterwards. The day, or the day after they are dropt, the calf follows the cow, and the foal the mare, to the field; and though from timidity they ſeldom remove far from the mother, yet they ſeem to walk about at their eaſe; which they could not do unleſs they could diſtinguiſh, with ſome degree of preciſion, the ſhape and proportion of the tangible objects which each viſible one repreſents. The degree of preciſion, however, with which the horſe is capable of making this diſtinction, ſeems at no period of his life to be very complete. He is at all times apt to ſtartle at many viſible objects, which, if they diſtinctly ſuggeſted to him the real ſhape and proportion of the tangible objects which they repreſent, could not be the objects of fear; at the trunk or root of an old tree, for example, which happens to be laid by the road ſide, at a great ſtone, or the fragment of a rock which happens to lie near the way where he is going. To reconcile him, even to a ſingle object of this kind, which has once alarmed him, frequently requires ſome ſkill, as well as much patience and good temper, in the rider. Such powers of ſight, however, as Nature has thought proper to

render him capable of acquiring, he ſeems to enjoy from the beginning, in as great perfection as he ever does afterwards.

The young of other quadrupeds, like thoſe of the birds which make their neſts in places of difficult acceſs, come blind into the world. Their ſight, however, ſoon opens, and as ſoon as it does ſo, they ſeem to enjoy it in the moſt complete perfection, as we may all obſerve in the puppy and the kitten. The ſame thing, I believe, may be ſaid of all other beaſts of prey, at leaſt of all thoſe concerning which I have been able to collect any diſtinct information. They come blind into the world; but as ſoon as their ſight opens, they appear to enjoy it in the moſt complete perfection.

It ſeems difficult to ſuppoſe that man is the only animal of which the young are not endowed with ſome inſtinctive perception of this kind. The young of the human ſpecies, however, continue ſo long in a ſtate of entire dependency, they muſt be ſo long carried about in the arms of their mothers or of their nurſes, that ſuch an inſtinctive perception may ſeem leſs neceſſary to them than to any other race of animals. Before it could be of any uſe to them, obſervation and experience may, by the known principle of the aſſociation of ideas, have ſufficiently connected in their young minds each viſible object with the correſponding tangible one which it is fitted to repreſent. Nature, it may be ſaid, never beſtows upon any animal any faculty which is not either neceſſary or uſeful, and an inſtinct of this kind would be altogether uſeleſs to an animal which muſt neceſſarily acquire the knowledge which the inſtinct is given to ſupply, long before that inſtinct could be of any uſe to it. Children, however, appear at ſo very early a period to know the diſtance, the ſhape, and magnitude of the different tangible objects which are preſented to them, that I am diſpoſed to believe that even they may have

have ſome inſtinctive perception of this kind; though poſſibly in a much weaker degree than the greater part of other animals. A child that is ſcarcely a month old, ſtretches out its hands to feel any little play-thing that is preſented to it. It diſtinguiſhes its nurſe, and the other people who are much about it, from ſtrangers. It clings to the former, and turns away from the latter. Hold a ſmall looking-glaſs before a child of not more than two or three months old, and it will ſtretch out its little arms behind the glaſs, in order to feel the child which it ſees, and which it imagines is at the back of the glaſs. It is deceived, no doubt; but even this ſort of deception ſufficiently demonſtrates that it has a tolerably diſtinct apprehenſion of the ordinary perſpective of Viſion, which it cannot well have learnt from obſervation and experience.

Do any of our other ſenſes, antecedently to ſuch obſervation and experience, inſtinctively ſuggeſt to us ſome conception of the ſolid and reſiſting ſubſtances which excite their reſpective ſenſations; though theſe ſenſations bear no ſort of reſemblance to thoſe ſubſtances?

The ſenſe of Taſting certainly does not. Before we can feel the ſenſation, the ſolid and reſiſting ſubſtance which excites it muſt be preſſed againſt the organs of Taſte, and muſt conſequently be perceived by them. Antecedently to obſervation and experience, therefore, the ſenſe of Taſting can never be ſaid inſtinctively to ſuggeſt ſome conception of that ſubſtance.

It may, perhaps, be otherwiſe with the ſenſe of Smelling. The young of all ſuckling animals, (of the Mammalia of Linnæus,) whether they are born with ſight or without it, yet as ſoon as they come into the world apply to the nipple of the mother in order to ſuck. In doing this they are evidently directed by the Smell. The Smell appears either to excite the appetite for the proper food, or at leaſt

to

to direct the new-born animal to the place where that food is to be found. It may perhaps do both the one and the other.

That when the ſtomach is empty, the Smell of agreeable food excites and irritates the appetite, is what we all muſt have frequently experienced. But the ſtomach of every new-born animal is neceſſarily empty. While in the womb it is nouriſhed, not by the mouth, but by the navel-ſtring. Children have been born apparently in the moſt perfect health and vigour, and have applied to ſuck in the uſual manner; but immediately, or ſoon after, have thrown up the milk, and in the courſe of a few hours have died vomiting and in convulſions. Upon opening their bodies it has been found that the inteſtinal tube or canal had never been opened or pierced in the whole extent of its length; but, like a ſack, admitted of no paſſage beyond a particular place. It could not have been in any reſpect by the mouth, therefore, but altogether by the navel-ſtring, that ſuch children had been nouriſhed and fed up to the degree of health and vigour in which they were born. Every animal, while in the womb, ſeems to draw its nouriſhment, more like a vegetable, from the root, than like an animal from the mouth; and that nouriſhment ſeems to be conveyed to all the different parts of the body by tubes and canals in many reſpects different from thoſe which afterwards perform the ſame function. As ſoon as it comes into the world, this new ſet of tubes and canals, which the providential care of Nature had for a long time before been gradually preparing, is all at once and inſtantaneouſly opened. They are all empty, and they require to be filled. An uneaſy ſenſation accompanies the one ſituation, and an agreeable one the other. The ſmell of the ſubſtance which is fitted for filling them, increaſes and irritates that uneaſy ſenſation, and produces hunger, or the appetite for food.

But

But all the appetites which take their origin from a certain ſtate of the body, ſeem to ſuggeſt the means of their own gratification; and, even long before experience, ſome anticipation or preconception of the pleaſure which attends that gratification. In the appetite for ſex, which frequently, I am diſpoſed to believe almoſt always, comes a long time before the age of puberty, this is perfectly and diſtinctly evident. The appetite for food ſuggeſts to the new-born infant the operation of ſucking, the only means by which it can poſſibly gratify that appetite. It is continually ſucking. It ſucks whatever is preſented to its mouth. It ſucks even when there is nothing preſented to its mouth, and ſome anticipation or preconception of the pleaſure which it is to enjoy in ſucking, ſeems to make it delight in putting its mouth into the ſhape and configuration by which it alone can enjoy that pleaſure. There are other appetites in which the moſt unexperienced imagination produces a ſimilar effect upon the organs which Nature has provided for their gratification.

The Smell not only excites the appetite, but directs to the object which can alone gratify that appetite. But by ſuggeſting the direction towards that object, the Smell muſt neceſſarily ſuggeſt ſome notion of diſtance and externality, which are neceſſarily involved in the idea of direction; in the idea of the line of motion by which the diſtance can beſt be overcome, and the mouth brought into contact with the unknown ſubſtance which is the object of the appetite. That the Smell ſhould alone ſuggeſt any preconception of the ſhape or magnitude of the external body to which it directs, ſeems not very probable. The ſenſation of Smell ſeems to have no ſort of affinity or correſpondence with ſhape or magnitude; and whatever preconception the infant may have of theſe, (and it may very probably have ſome ſuch preconception,) is likely to be ſuggeſted, not

ſo much directly by the Smell, and indirectly by the appetite excited by that Smell; as by the principle which teaches the child to mould its mouth into the conformation and action of ſucking, even before it reaches the object to which alone that conformation and action can be uſefully applied.

The Smell, however, as it ſuggeſts the direction by which the external body muſt be approached, muſt ſuggeſt at leaſt ſome vague idea or preconception of the exiſtence of that body; of the thing to which it directs, though not perhaps of the preciſe ſhape and magnitude of that thing. The infant, too, feeling its mouth attracted and drawn as it were towards that external body, muſt conceive the Smell which thus draws and attracts it, as ſomething belonging to or proceeding from that body, or what is afterwards denominated and obſcurely underſtood to be as a ſort of quality or attribute of that body.

The Smell, too, may very probably ſuggeſt ſome even tolerably diſtinct perception of the Taſte of the food to which it directs. The reſpective objects of our different external ſenſes ſeem, indeed, the greater part of them, to bear no ſort of reſemblance to one another. Colour bears no ſort of reſemblance to Solidity, nor to Heat, nor to Cold, nor to Sound, nor to Smell, nor to Taſte. To this general rule, however, there ſeems to be one, and perhaps but one exception. The ſenſations of Smell and Taſte ſeem evidently to bear ſome ſort of reſemblance to one another. Smell appears to have been given to us by Nature as the director of Taſte. It announces, as it were, before trial, what is likely to be the Taſte of the food which is ſet before us. Though perceived by a different organ, it ſeems in many caſes to be but a weaker ſenſation nearly of the ſame kind with that of the Taſte which that announces. It is very natural to ſuppoſe, therefore, that the Smell may ſuggeſt

to

to the infant ſome tolerably diſtinct preconception of the Taſte of the food which it announces, and may, even before experience, make its mouth, as we ſay, water for that food.

That numerous diviſion of animals which Linnæus ranks under the claſs of *worms*, have, ſcarcely any of them, any head. They neither ſee nor hear, have neither eyes nor ears; but many of them have the power of ſelf-motion, and appear to move about in ſearch of their food. They can be directed in this ſearch by no other ſenſe than that of Smelling. The moſt accurate microſcopical obſervations, however, have never been able to diſcover in ſuch animals any diſtinct organ of Smell. They have a mouth and a ſtomach, but no noſtrils. The organ of Taſte, it is probable, has in them a ſenſibility of the ſame kind with that which the olfactory nerves have in more perfect animals. They may, as it were, taſte at a diſtance, and be attracted to their food by an affection of the ſame organ by which they afterwards enjoy it; and Smell and Taſte may in them be no otherwiſe diſtinguiſhed than as weaker or ſtronger ſenſations derived from the ſame organ.

The ſenſations of Heat and Cold, when excited by the preſſure of ſome body either heated or cooled beyond the actual temperature of our own organs, cannot be ſaid, antecedently to obſervation and experience, inſtinctively to ſuggeſt any conception of the ſolid and reſiſting ſubſtance which excites them. What was ſaid of the ſenſe of Taſte may very properly be ſaid here. Before we can feel thoſe ſenſations, the preſſure of the external body which excites them muſt neceſſarily ſuggeſt, not only ſome conception, but the moſt diſtinct conviction of its own external and independent exiſtence.

It may be otherwiſe, perhaps, when thoſe ſenſations are either of them excited by the temperature of the external air. In a calm

day when there is no wind, we ſcarcely perceive the external air as a ſolid body; and the ſenſations of Heat and Cold, it may be thought, are then felt merely as affections of our own body, without any reference to any thing external. Several caſes, however, may be conceived, in which it muſt be allowed, I imagine, that thoſe ſenſations, even when excited in this manner, muſt ſuggeſt ſome vague notion of ſome external thing or ſubſtance which excites them. A new-born animal, which had the power of ſelf-motion, and which felt its body, either agreeably or diſagreeably, more heated or more cooled on the one ſide than on the other, would, I imagine, inſtinctively, and antecedently *to all obſervation* and experience, endeavour to move towards the ſide in which it felt the agreeable, and to withdraw from that in which it felt the diſagreeable ſenſation. But the very deſire of motion ſuppoſes ſome notion or preconception of externality; and the deſire to move towards the ſide of the agreeable, or from that of the diſagreeable ſenſation, ſuppoſes at leaſt ſome vague notion of ſome external thing or place which is the cauſe of thoſe reſpective ſenſations.

The degrees of Heat and Cold which are agreeable, it has been found from experience, are likewiſe healthful; and thoſe which are diſagreeable, unwholeſome. The degree of their unwholeſomeneſs, too, ſeems to be pretty much in proportion to that of their diſagreeableneſs. If either of them is ſo diſagreeable as to be painful, it is generally deſtructive; and that, too, in a very ſhort period of time. Thoſe ſenſations appear to have been given us for the preſervation of our own bodies. They neceſſarily excite the deſire of changing our ſituation when it is unwholeſome or deſtructive; and when it is healthy, they allow us, or rather they entice us, to remain in it. But the deſire of changing our ſituation neceſſarily ſuppoſes ſome idea of externality; or of motion into a place different from that in which we actually are; and even the deſire of remaining in the

ſame place ſuppoſes ſome idea of at leaſt the poſſibility of changing. Thoſe ſenſations could not well have anſwered the intention of Nature, had they not thus inſtinctively ſuggeſted ſome vague notion of external exiſtence.

That Sound, the object of the ſenſe of Hearing, though perceived itſelf as in the ear, and nowhere but in the ear, may likewiſe, inſtinctively, and antecedently to all obſervation and experience, obſcurely ſuggeſt ſome vague notion of ſome external ſubſtance or thing which excites it, I am much diſpoſed to believe. I acknowledge, however, that I have not been able to recollect any one inſtance in which this ſenſe ſeems ſo diſtinctly to produce this effect, as that of Seeing, that of Smelling, and even that of Heat and Cold, appear to do in ſome particular caſes. Unuſual and unexpected Sound alarms always, and diſpoſes us to look about for ſome external ſubſtance or thing as the cauſe which excites it, or from which it proceeds. Sound, however, conſidered merely as a ſenſation, or as an affection of the organ of Hearing, can in moſt caſes neither benefit nor hurt us. It may be agreeable or diſagreeable, but in its own nature it does not ſeem to announce any thing beyond the immediate feeling. It ſhould not therefore excite any alarm. Alarm is always the fear of ſome uncertain evil beyond what is immediately felt, and from ſome unknown and external cauſe. But all animals, and men among the reſt, feel ſome degree of this alarm, ſtart, are rouſed and rendered circumſpect and attentive by unuſual and unexpected Sound. This effect, too, is produced ſo readily and ſo inſtantaneouſly that it bears every mark of an inſtinctive ſuggeſtion of an impreſſion immediately ſtruck by the hand of Nature, which does not wait for any recollection of paſt obſervation and experience. The hare, and all thoſe other timid animals to whom flight is the only defence, are ſuppoſed to poſſeſs the ſenſe of Hearing

ing in the higheſt degree of activeneſs. It ſeems to be the ſenſe in which cowards are very likely to excel.

The three ſenſes of Seeing, Hearing, and Smelling, ſeem to be given to us by Nature, not ſo much in order to inform us concerning the actual ſituation of our bodies, as concerning that of thoſe other external bodies, which, though at ſome diſtance from us, may ſooner or later affect that actual ſituation, and eventually either benefit or hurt us.

THE END

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